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HELMINTHOLOGICAL ABSTRACTS

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INCORPORATING BIBLIOGRAPHY OF HELMINTHOLOGY

FOR THE YEAR 1957

Vol. 26, Part 2

56—Agricultural Gazette of New South Wales.

a. GEE, C. D., 1957.—" Bluestone in the control of liver fluke." **68** (3), 142–143, 150.

57—Agricultural Review. London.

a. GOUGH, H. C., 1957.—" The pea root eelworm." **2** (11), 44.

(57a) The pea root eelworm in Britain was first recognized in 1912. Since then it has been observed sporadically in allotments and market gardens and during the past ten years on an increasing number of occasions on farm land. In a survey of pea crops in eastern England during 1956 this eelworm was found in 12 out of 173 fields but only in three did the infection give rise to patchiness in the crop. As field and broad beans and tares are also susceptible, peas may fail in fields in which these have been grown regularly. No serious losses have yet resulted but several failures have been reported although intervals of 5 to 10 years have elapsed since the last sowing of the previous pea crop. R.T.L.

58—American Journal of Hygiene.

a. SCHWABE, C. W., 1957.—" Observations on the respiration of free-living and parasitic *Nippostrongylus muris* larvae." **65** (3), 325–337.

b. SCHWABE, C. W., 1957.—" Effects of normal and immune rat sera upon the respiration of free-living and parasitic *Nippostrongylus muris* larvae." **65** (3), 338–343.

(58a) Schwabe found that parasitic third-stage larvae of *Nippostrongylus muris* had a lower endogenous Qo_2 and a higher R.Q. than the free-living third-stage larvae. Carbon dioxide (5% in the gas phase) had no effect on the free-living larvae but increased the oxygen uptake of parasitic larvae. The endogenous Qo_2 of the free-living larvae was affected by the age of the larvae, by the *p*H and sodium chloride concentration of the medium. Substrates such as pyruvate and succinate, which had no effect on the Qo_2 of intact free-living larvae, stimulated oxygen uptake of the minced larvae and intact parasitic larvae. W.P.R.

(58b) Schwabe found that the Qo_2 of both free-living and parasitic third-stage larvae of *Nippostrongylus muris* was unaffected by normal rat serum when compared to oxygen uptake in buffered isotonic sodium chloride. Immune serum from rats inhibited the oxygen uptake of the free-living larvae only. When exogenous glucose was supplied, however, the immune serum inhibited parasitic larvae also. W.P.R.

59—American Journal of Pathology.

a. GOULD, S. E., GOMBERG, H. J., VILLELLA, J. B. & HERTZ, C. S., 1957.—" Studies on *Trichinella spiralis*. VI. Effects of cobalt-60 and X-ray on morphology and reproduction." **33** (1), 79–105.

(59a) Gould and his co-workers have continued their studies on the effect of irradiation on *Trichinella spiralis*. Excysted larvae were exposed to various doses of cobalt-60 and X-ray and were subsequently fed to white rats. It was found that in each instance the dose of cobalt-60 required to produce a given effect was about three times that of X-ray; the possible

cause of this difference is discussed. Sexual sterilization was produced by doses of 12,000 rep (roentgen equivalent physical) and over of cobalt-60 and 4,000 roentgens of X-ray and larvae which had been exposed to 18,000 rep cobalt-60 or 7,000 r. X-ray were almost all eliminated from the small intestine within 36 hours of infection. Morphological changes in irradiated larvae did not become apparent during the first 18 hours after infection but those appearing from 24 hours to six days after infection are described and illustrated by photomicrographs. The information on the effect of various doses is summarized in a series of tables. S.W.

60—American Journal of Tropical Medicine and Hygiene.

a. CHANDLER, A. C., 1957.—" Interrelations between nutrition and infectious disease in the tropics. Presidential address." **6** (2), 195–208.
b. ISHAK, K. G., HAZZI, C., SALIB, M., SABOUR, M. & MAHROUS, A. R., 1957.—" Needle biopsy in the etiologic diagnosis of splenomegaly." **6** (2), 257–265.
c. NAGATY, H. F., MOAWAD, M. B. & SALEM, S., 1957.—" Papular skin lesions in which schistosome eggs were found." **6** (2), 266–270.
d. SADUN, E. H., NORMAN, L. & BROOKE, M. M., 1957.—" The production of antibodies in rabbits infected with irradiated *Trichinella spiralis* larvae." **6** (2), 271–279.
e. WILLIAMS, J. E., OTORI, Y., MOON, A. P., FRICK, L. P. & RITCHIE, L. S., 1957.—" Repopulation control of *Oncomelania nosophora* by molluscicidal applications against juvenile snails through the medium of irrigation water." **6** (2), 304–312.
f. HARRY, H. W., CUMBIE, B. G. & MARTINEZ DE JESUS, J., 1957.—" Studies on the quality of fresh waters of Puerto Rico relative to the occurrence of *Australorbis glabratus* (Say)." **6** (2), 313–322.
†g. CHERNIN, E., 1957.—" A method for securing bacteriologically sterile snails (*Australorbis glabratus*)." **6** (2), 374–375.

(60b) Needle biopsy of the spleen proved a valuable and safe means of differentiating chronic congestive splenomegaly associated with schistosomiasis from other types of splenic enlargement. No complications resulted in 55 cases. R.T.L.

(60c) Skin biopsy revealed *Schistosoma haematobium* eggs in papulopustular eruptions on the chest, abdomen, thighs and gluteal region of a girl 12 years of age. The papules diminished and were followed by eczematous reactions after antibilharzial treatment. R.T.L.

(60d) When given by the mouth, to rabbits, a single dose of irradiated *Trichinella spiralis* larvae did not produce antibodies in sufficient quantity to be detected by flocculation or complement-fixation tests. Multiple doses gave low titres of brief duration. Extra-intestinal inoculations gave relatively high titres. If commercial irradiation of pork is adopted as a protection against trichinosis the significance of a positive serology may have to be reviewed. R.T.L.

(60e) Repeated application of molluscicides for at least five years may fail to eradicate *Oncomelania nosophora* owing to its long life and prolonged fertility but experiments suggest that repopulation control could be effected if directed against the young snails by the use of 1 or 2 p.p.m. of dinitro-o-cyclohexylphenol in irrigation water at three week intervals during the summer. R.T.L.

(60f) As the amount of copper in natural waters in Puerto Rico ranges from nil to 0·33 p.p.m. it is suggested that copper and perhaps other heavy metals may be responsible for the absence of *Australorbis glabratus* in most dilute waters. Its absence in flowing waters on limestone may be related to the large excess of weak acid radicals (CO_3 and HCO_3) over strong acid radicals (Cl and SO_4). R.T.L.

(60g) To secure bacteriologically sterile *Australorbis glabratus*, egg-masses of laboratory reared snails were removed from vegetation, kept until mature, and then placed in weak detergent. Those eggs containing fully developed embryos were freed by dissection. After brief immersion in weak sodium hypochlorite solution they were washed and transferred to tubes containing penicillin and streptomycin in a suitable salt solution. R.T.L.

†Abstract of paper presented at the 5th Annual Meeting of the American Society of Tropical Medicine and Hygiene, New Orleans, October 31 to November 3, 1956.

60—American Journal of Tropical Medicine and Hygiene (cont.)

†h. KUNTZ, R. E., 1957.—" Relationship of temperature to molluscocidal activity." **6** (2), 375.
†i. DEGIUSTI, D. L., 1957.—" Parasites of rats collected in the city of Detroit." **6** (2), 375.
†j. RITCHIE, L. S., LIN, S., FRICK, L. P., MOON, A. P., WILLIAMS, J. E., ASAKURA, S. & HISHINUMA, Y., 1957.—" The possible influence of pH and specific gravity on the formalin ether (406th MGL) technic in the concentration of fecal eggs and cysts of certain parasites." **6** (2), 375–376.
†k. WAGNER, E. D., INABA, D. & WONG, L. W., 1957.—" Species crossing in *Oncomelania*." **6** (2), 376.
†l. MALDONADO, J. F. & OLIVER-GONZÁLEZ, J., 1957.—" The problem of schistosomiasis in Puerto Rico." **6** (2), 381.
†m. MILLER, J. H., SWARTZWELDER, C. & SAPPENFIELD, R. W., 1957.—" A comparison of the efficacy of single doses of piperazine salts for the treatment of cases of ascariasis." **6** (2), 382–383.
†n. SAPPENFIELD, R. W., SWARTZWELDER, C. & MILLER, J. H., 1957.—" The use of piperazine citrate in the treatment of apparent partial intestinal obstruction due to ascariasis." **6** (2), 383.

(60h) Where feasible, molluscicides should be applied during the warmer months of the year as their potency is enchanced by elevated temperatures. R.T.L.

(60i) Examination of 226 *Rattus rattus norvegicus* collected from 126 different parts of Detroit gave the following incidence: *Heterakis spumosa* 77%, *Capillaria gastrica* 52%, *Trichosomoides crassicauda* 34%, *Nippostrongylus muris* 26%, *Hymenolepis nana* 13%, *H. diminuta* 10%, *Cysticercus fasciolaris* 25%, *Fibricola cratera* 0·5%. *Trichinella spiralis* was present in the diaphragms of 2% of 1,200 rats (but excluding those from slaughterhouse areas), 4·3% of 23 cats and 3·9% of 200 dogs. R.T.L.

(60j) When formalin-fixed faeces in aqueous solutions of *p*H values 4, 7 and 10, (buffered), were each concentrated by the formalin-ether technique, the reduced number of ascaris ova recovered from the *p*H 4 solution affected its diagnostic efficiency, the reduction in the *Schistosoma japonicum* eggs recovered was excessive but the recovery of hookworm ova was effective. In *p*H 7 the recovery of trichuris ova was optimal and effective for hookworm ova. *p*H 10 gave the best results for ascaris and *S. japonicum* eggs. When the specific gravity of each of these solutions was lowered by the addition of 20% of alcohol the number of hookworm ova was scarcely affected but there was a marked increase in the number of whipworm, ascaris and *S. japonicum* eggs recovered, particularly from the *p*H 7 solution. The combination of *p*H 10 with alcohol gave a level of efficiency for *S. japonicum* eggs comparable with the MIF procedure. R.T.L.

(60k) All possible crossings of *Oncomelania nosophora*, *O. quadrasi* and *O. formosana* have been made successfully with male and female of each species. R.T.L.

(60l) The improved economic situation, the provision of safe water supplies and the effect of education are probably responsible for the decline in the incidence of *Schistosoma mansoni* infection in Puerto Rico since 1953, although soil pollution is still high and control measures have not been instituted. R.T.L.

(60m) No practical difference was noted in the efficacy against ascariasis of piperazine citrate, piperazine adipate and piperazine phosphate given in single weekly doses of 70 mg. per lb. with a maximum of 3 gm. A single initial dose of piperazine citrate, repeated one week later, eliminated the infection in 97% of the cases tested. R.T.L.

(60n) Seven patients, under 4½ years old, with symptoms of intestinal obstruction and heavy ascaris infection, improved dramatically after treatment with piperazine citrate. R.T.L.

†Abstract of paper presented at the 5th Annual Meeting of the American Society of Tropical Medicine and Hygiene, New Orleans, October 31 to November 3, 1956.

60—American Journal of Tropical Medicine and Hygiene (cont.)

†o. NORTON, S. & DE BEER, E. J., 1957.—" Investigation of the action of piperazine on *Ascaris lumbricoides*." **6** (2), 383.

†p. BUEDING, E. & FARROW, G. M., 1957.—" Effect of piperazine hexahydrate on succinate production by *Ascaris lumbricoides*." **6** (2), 383–384.

†q. SAZ, H. J. & HUBBARD, J. A., 1957.—" Studies of the 'malic enzyme' and carbon dioxide fixation in *Ascaris lumbricoides*." **6** (2), 384.

†r. OLIVER-GONZÁLEZ, J., 1957.—" Hematopoietic stimulating property of Ascaris polysaccharide." **6** (2), 384–385.

†s. LAURENCE, K. A. & NOLF, L. O., 1957.—" Some observations on the sensitization of mice to Ascaris perienteric fluid proteins." **6** (2), 385.

†t. SADUN, E. H., NORMAN, L. & ALLAIN, D., 1957.—" Studies on the serology of visceral larva migrans by the use of bentonite flocculation test." **6** (2), 385.

†u. JONES, C. A., SWARTZWELDER, C. & ABADIE, S. H., 1957.—" On the comparative distribution of phosphate esters in *Trichuris vulpis*, *Ascaris lumbricoides*, and *Strongyloides ratti*." **6** (2), 385–386.

(60o) That electrically induced muscle spasm in the eviscerated anterior half of an *Ascaris lumbricoides* was not blocked by piperazine and d-tubocurarine indicates that piperazine causes paralysis in ascaris by directly blocking the neuro-muscular junction. R.T.L.

(60p) The amount of succinate excreted by *Ascaris lumbricoides* in concentrations of 0·05% of piperazine was reduced by over 80% and its concentration in the worms was significantly decreased. But subsequent transference of the worms to a piperazine-free medium restored the production of succinate to normal. R.T.L.

(60q) The soluble "malic enzyme" from homogenates of ascaris muscle differs notably from that from mammalian, bacterial and plant tissues in that it occurs in muscle, is active both with DPN and TPN and does not catalyse the decarboxylation of oxalacetate (between *p*H 5 to 8). Moreover it catalyses the reverse reaction. After incubation of whole ascaris worms with glucose and radioactive carbon dioxide 91 μM of succinate were isolated, incorporating a minimum 11 μM of carbon dioxide. Carbon dioxide fixation therefore is an important factor in ascaris metabolism. R.T.L.

(60r) Mice were injected daily over a period of 30 days with a polysaccharide, of a complex nature, extracted from the various tissues of *Ascaris lumbricoides*. Some of the mice were killed every fifth day during the period and their livers sectioned. There was evidence of diffuse haematopoiesis, and the enlarged portal fields showed dense masses of granulocytic, erythrocytic, lymphocytic and megakariocytic cells. Besides extramedullary haematopoiesis there was hyperactivity of the spleen, lymph nodes and bone marrow. R.T.L.

(60s) White mice were sensitized to perienteric fluid, of which electrophoretic patterns showed five protein components. When tested by anaphylaxis those sensitized by inhalation or by three injections suspended in Ramons adjuvant showed no reaction. Those receiving internasal and passive sensitization with immune rat serum showed typical reactions with 40% to 50% fatal anaphylaxis. Mice which had recovered from an infection with ascaris showed shock reactions after intravenous injection of the perienteric fluid. R.T.L.

(60t) The bentonite flocculation test with purified acid soluble protein fractions obtained from *Toxocara canis* was positive with sera from experimentally infected or artifically immunized rabbits seven to 20 days after inoculation. Five out of 21 sera from children with suspected visceral larva migrans and two out of 105 sera from Korean prisoners were positive, whereas sera from 174 asymptomatic Americans were all negative. R.T.L.

†Abstract of paper presented at the 5th Annual Meeting of the American Society of Tropical Medicine and Hygiene, New Orleans, October 31 to November 3, 1956.

60—American Journal of Tropical Medicine and Hygiene (cont.)

†v. BROWN, H. W. & PERNA, V., 1957.—" An overwhelming infection with *Strongyloides stercoralis*." **6** (2), 386.

†w. GOLDBERG, E. & NOLF, L. O., 1957.—" The effect of carbon monoxide on homogenates of *Trichinella spiralis* larvae." **6** (2), 386.

†x. MARKELL, E. K., 1957.—" Effect of cortisone treatment on immunity to subsequent reinfection with Trichinella in the rat." **6** (2), 386–387.

†y. NORMAN, L. & SADUN, E. H., 1957.—" The use of a metabolic antigen in the serological diagnosis of trichinosis in humans and hogs." **6** (2), 387.

†z. BRIGGS, N. T., 1957.—" Factors influencing the appearance of precipitates on larvae of *Litomosoides carinii* in cotton rat and white rat sera." **6** (2), 387.

†ba. MACDONALD, E. M. & SCOTT, J. A., 1957.—" The early induction and persistent effect of immunity to the filarial worms of cotton rats." **6** (2), 388.

(60v) In a native of Panama who had died in New York City where she had lived for 36 years large numbers of mature females, larvae and eggs of *Strongyloides stercoralis* were found in the stomach, duodenum and jejunum and migrating larvae in the mucosa, wall and subserosa of the small and large intestine, in the mesenteric lymph gland, the peripancreatic lymphatics, the liver, in the walls of the portal vein, in the lungs, in the capsule of the thyroid and in connective tissue adjacent to the parathyroids. R.T.L.

(60w) In experiments with homogenates of *Trichinella spiralis* larvae there was an increase of 10% in the oxygen consumption of a system containing succinate or ascorbate as a hydrogen donor in an atmosphere of 95% CO, 5% O_2. In the dark a 30% inhibition of the cytochrome oxidase activity of the larvae by carbon monoxide could be demonstrated by spectrophotometric methods. R.T.L.

(60x) Two batches of Wistar rats, after being infected by stomach tube with equal numbers of trichina larvae, were injected subcutaneously with 3 mg. of cortisone acetate daily for 30 and 60 days respectively. Five months later they were reinfected and after six weeks were autopsied. Little or no immunity had resulted from the initial infection whereas the controls, which were similarly infected, had developed a high degree of immunity to the subsequent infection. R.T.L.

(60y) The flocculation test with metabolic antigen proved more sensitive than with somatic antigen with human sera from suspected cases of *Trichinella* infection but no significant difference was observed with sera from pigs. R.T.L.

(60z) Oral precipitates were formed on *Litomosoides carinii* larvae in serum taken from cotton-rats 25 days after these had been subcutaneously injected with small numbers of larvae. The reactions were more marked in serum from rats which received three times as many larvae at one time or in three successive doses at five-day intervals. When developing worms were recovered from cotton-rats seven days after infection and transferred into the abdominal cavity of other cotton-rats at weekly intervals on three successive occasions, the serum 25 days after the first transfer, induced only sporadic and slight precipitates and a relatively high percentage of the introduced worms were recovered from the abdominal cavity, whereas the serum of controls which had received the same number of infective larvae 25 days previously consistently induced precipitates but relatively few developing worms were recovered and these were mostly from the pleural cavity. R.T.L.

(60ba) Macdonald & Scott submit further experimental evidence in support of their hypothesis that the growth retarding influence on *Litomosoides carinii* transferred surgically from previously uninfected cotton-rats to previously infected animals does not operate until after the first seven days. R.T.L.

†Abstract of paper presented at the 5th Annual Meeting of the American Society of Tropical Medicine and Hygiene, New Orleans, October 31 to November 3, 1956.

60—American Journal of Tropical Medicine and Hygiene (cont.)

†bb. PRICE, D. L., 1957.—" A new epidemiological field kit." **6** (2), 388.
†bc. PENA-CHAVARRIA, A., LIZANO, C. & XIRINACHS, H., 1957.—" The treatment of ascariasis with piperazine citrate in typhoid fever patients." **6** (2), 388.
†bd. NATT, M. P., GUSTAFSON, R. H. & O'CONNOR, J. R., 1957.—" Comparison of the antioxyurid activity of NF-23 (ethyl 3-(5-nitro-2-furyl)-acrylate) and piperazine citrate against the mouse pinworm, *Syphacia obvelata*." **6** (2), 389.
†be. JUNG, R. C., EMERSON, S. M. & SEWELL, B., 1957.—" Chemoprophylaxis of enterobiasis." **6** (2), 389.
†bf. SWARTZWELDER, C., MILLER, J. H., SAPPENFIELD, R. W. & MARTINEZ, F., 1957.—" The efficacy of short and long regimes for the treatment of enterobiasis with piperazine citrate." **6** (2), 389–390.
†bg. STIREWALT, M. A., 1957.—" Histochemical assay of the secretions from the acetabular gland complex of cercariae of *Schistosoma mansoni*." **6** (2), 390.
†bh. COKER, C. M. & OLIVER-GONZÁLEZ, J., 1957.—" Experiments on anti-schistosome circumoval precipitating antibody in mice." **6** (2), 390.
†bi. SENTERFIT, L. B., 1957.—" The development of antibodies in schistosome infection as measured by the miracidial immobilization reaction." **6** (2), 390–391.

(60bb) A kit for collecting blood or serum, preparing blood smears, collecting arthropod vectors and for dissecting or operating on small mammals in field studies on filariasis, was demonstrated and is briefly described. R.T.L.

(60bc) Thirty-six typhoid patients were treated with piperazine citrate for *Ascaris lumbricoides* infection. There were no untoward reactions. The flaccid condition caused by the piperazine minimizes the possibility of the worms producing intestinal perforation. R.T.L.

(60bd) Of several nitrofuran compounds tested against *Syphacia obvelata* in naturally infected mice Ethyl 3 (5-Nitro-2-furyl) acrylate proved particularly active and non-toxic. This compound, designated NF-23, administered as a single dose twice daily to mice for one, two, four and eight days compared favourably with gentian violet, terramycin and piperazine citrate. R.T.L.

(60be) The administration of 5 ml. of syrup of piperazine thrice daily for a week failed to cure five out of 24 boys heavily infected with *Enterobius vermicularis*, but when given for two weeks to 25 boys only one was not cured. The same dose in tablet form for one week failed to cure four out of 23 boys. 11 out of 23 who received 15 ml. did not become reinfected during the following 20 weeks while 12 out of 15 who received 45 ml. did not show any signs of reinfection during the following seven weeks. The infection in those who became reinfected after a weekly dose of piperazine was lighter than in the controls. R.T.L.

(60bf) A reduction in the cost and duration of treatment of *Enterobius vermicularis* resulted from the administration of a single daily dose of piperazine citrate syrup for six consecutive days. R.T.L.

(60bg) The results of histochemical assay suggest that the secretion of the acetabular gland complex of *Schistosoma mansoni* cercariae is either a muco- or glyco-protein. R.T.L.

(60bh) In mice experimentally infected with *Schistosoma mansoni* circumoval precipitins first appeared in the serum after about 50 days; and on the 46th day in mice injected intraperitoneally with living schistosome eggs. The half life of circulating circumoval antibody, passively transferred, was less than six days; its longevity was not affected by cortisone which had, however, a suppressive effect on its initial formation. R.T.L.

(60bi) There is a correlation between the immobilization of *Schistosoma mansoni* miracidia and the cercarial agglutination but none between the immobilization reaction and the circumoval or the circumcercarial precipitate. The immobilization reaction is due to the

†Abstract of paper presented at the 5th Annual Meeting of the American Society of Tropical Medicine and Hygiene, New Orleans, October 31 to November 3, 1956.

60—American Journal of Tropical Medicine and Hygiene (cont.)

†bj. HSÜ, H. F. & HSÜ, S. L. LI, 1957.—" Interstrain variation of the egg shape of *Schistosoma japonicum*." **6** (2), 391.

†bk. MANSOUR, T. E., 1957.—" Studies on the phenol oxidase of the liver fluke, *Fasciola hepatica*." **6** (2), 391–392.

presence in the serum of antibody and the antigen which stimulates its production is present in all stages of the parasite in its mammalian host. The level of immobilizing antibody is high in acute infections and lower or absent in chronic infections. R.T.L.

(60bj) The Chinese and Japanese strains of *Schistosoma japonicum* differ in the shape of the egg not only from the non-human Formosan strain but also from each other. R.T.L.

(60bk) Mansour has found that epinephrine has no stimulating effect on the rhythmical activity of *Fasciola hepatica* as, due to a phenol oxidase, homogenates of the fluke catalyse its oxidation at a high rate. Serotonin and related indolamines inhibit the phenol oxidase activity which is abolished by diethyl thiocarbamate. That this oxidase is a copper enzyme is probably indicated by the reversal of this inhibition by the addition of copper ions. R.T.L.

61—American Journal of Veterinary Research.

a. LINDQUIST, W. D., 1957.—" The use of low level piperazine on pigs naturally infected with *Ascaris lumbricoides*." **18** (68), 508–510.

b. CAUTHEN, G. E., 1957.—" Weight gain in phenothiazine-treated calves." **18** (68), 608–611.

c. CAUTHEN, G. E., 1957.—" Low level phenothiazine administration to weaned beef calves." **18** (68), 612–613.

(61a) Two groups of five young pigs, kept indoors on concrete, received 107 mg. of polymeric piperazine-1-carbodithioic acid per lb. of dry feed for a week (about one fifth of the therapeutic dose of 100 mg. per kg. body-weight per day). One group remained on concrete but received no further piperazine. The other, placed on pasture infected with *Ascaris lumbricoides*, continued to receive the drug. A third group was kept on pasture without receiving piperazine. At necropsy, larvae were recovered from the intestines and spotting of the liver was present in both outdoor groups. The group kept on concrete yielded no worms but each of the livers had one or two spots. Occasionally a pig with a clean liver had numerous worms. These may have resulted from larvae which had by-passed the liver in the lymphatics. M.McK.

(61b) Although it has been shown that phenothiazine treatment increases the weight gains of cattle of one and two years of age and with a moderate degree of subclinical parasitism, Cauthen, working in Texas, found that three of four groups of calves moderately infected (i.e. passing 150 to 400 eggs per gm. of faeces) gained less than controls when treated at about the time of weaning, (i.e. in their seventh or eighth month). Altogether 707 calves received a single dose of 60 gm. to 96 gm. of phenothiazine, 68 days before, to 90 days after, weaning. Among those with heavy subclinical parasitism (600–1,000 e.p.g.) clinical symptoms appeared before the end of the tests but the treated calves gained an average of 22 lb. each whereas the controls lost 11 lb. M.McK.

(61c) Forty beef calves, which had each received 90 gm. of phenothiazine given about 60 days after weaning and had then ingested approximately 1 gm. of phenothiazine in their daily feed for 122 days, gained the same average weight as 41 controls but their egg counts were 127 eggs per gm. as compared with 161 e.p.g. in the controls. Seventeen weaned calves received about 2 gm. of phenothiazine daily for 88–179 days, with or without a preceding dose of 90 gm. Each calf gained 25 lb. to 60 lb. more than the controls and the egg counts averaged 140–144 e.p.g. as compared with 205–325 e.p.g. in the controls. M.McK.

†Abstract of paper presented at the 5th Annual Meeting of the American Society of Tropical Medicine and Hygiene, New Orleans, October 31 to November 3, 1956.

62—American Midland Naturalist.

a. WOOD, R. A. & MIZELLE, J. D., 1957.—" Studies on monogenetic trematodes. XXI. North American Gyrodactylinae, Dactylogyrinae and a new host record for *Urocleidus dispar* (Mueller, 1936)." **57** (1), 183–202.

b. GULLION, G. W., 1957.—" Gambel quail disease and parasite investigations in Nevada." **57** (2), 414–420.

c. BERBERIAN, J. F. & MIZELLE, J. D., 1957.—" Developmental studies on *Haemonchus contortus* Rudolphi (1803)." **57** (2), 421–439.

(62a) The general morphology of the species of *Gyrodactylus* and *Dactylogyrus* are outlined and their differences noted. Seven new species of *Gyrodactylus* and four new species of *Dactylogyrus* are described from the gills of fishes in North America, viz., *G. egregius* n.sp. and *G. richardsonius* n.sp. from *Richardsonius egregius*; *G. rhinichthius* n.sp. from *Rhinichthys osculus robustus*; *G. bairdi* n.sp. from *Cottus b. bairdi*; *G. limi* n.sp. from *Umbra limi*; *G. couesius* n.sp. from *Couesius plumbius dissimilis*; *G. micropogonus* n.sp. from *Micropogon undulatus*; *Dactylogyrus nuchalis* n.sp. from *Hybognathus n. nuchalis*; *D. osculus* n.sp. from *Rhinichthys osculus robustus*; *D. rhinichthius* n.sp. from *Rhinichthys atratulus meleagris* and *D. semotilis* n.sp. from *Semotilis a. atromaculatus*. *Archoplites interruptus* is a new host record for *Urocleidus dispar*. The seventeen species of North American Gyrodactylinae and their fish hosts are listed under parasites and also under hosts. The subspecific categories proposed by Yin & Sproston in 1948 are rejected and *Neodactylogyrus* Price, 1938 is considered invalid. R.T.L.

(62b) In a survey of parasites of *Lophortyx gambellii* in Nevada, microfilariae were found in the blood of three out of 110 and intestinal helminths in 26 out of 61. Cestodes, probably *Rhabdometra odiosa*, occurred in three and caecal worms, identified as *Auloncephalus lindquisti*, in 21. The name *A. lindquisti* is used in preference to *Subulura strongylina* as the latter has not been adequately described. S.W.

(62c) Berberian & Mizelle have conducted a series of precise experiments on the development of *Haemonchus contortus* ova to the infective stage and the effect of various chemicals on both ova and larvae. As culture media they used tap-water and the filtrate from a decoction of dried sheep faeces. Ova were exposed to a series of constant temperatures (5·56°C. to 37·8°C.) at 100% relative humidity in both media and in covered and uncovered containers. The optimum temperature was 33·3°C. In tap-water the incubation period was invariably shorter than in the faeces decoction but after hatching development in the latter was accelerated, infective larvae appearing at the same time in both media. The differences in developmental rate in covered and uncovered dishes were not uniform at all temperatures but at 33·3°C. development was completed in 60 hours in uncovered and 65 hours in covered dishes, irrespective of the medium. Detailed data on the effects of different temperatures on development and on the proportion of larvae reaching the infective stage are given. In tests of the effect of humidity, ova kept at 33·3°C. failed to develop and were killed at a relative humidity of 96% or lower. Larvae at the first or second stage were also extremely susceptible to desiccation but third-stage larvae were very resistant. Of the chemicals tested Orvus WA and Santomerse 3 were the most effective surface-active agents against ova and larvae, arresting development at a concentration of 0·05%. At 1% D.D.T. was not ovicidal but phenol and copper sulphate killed ova in three and eight-and-a-half hours respectively and larvae in three hours. S.W.

63—Annales de l'Institut Pasteur. Paris.

a. DESCHIENS, R., 1957.—" Les facteurs conditionnant l'habitat des mollusques vecteurs des bilharzioses, leurs incidences épidémiologiques. I. Généralités. Facteurs physiques." **92** (5), 576–585.

b. DESCHIENS, R., 1957.—" Les facteurs conditionnant l'habitat des mollusques vecteurs des bilharzioses, leurs incidences épidémiologiques. II. Facteurs chimiques. Nutrition." **92** (6), 711–727.

(63a) In this first part of his review of the factors which govern the habitats of schistosome intermediaries, Deschiens deals chiefly with the physical factors. He considers the

climatic conditions of various types of site (forest, savannah, desert, mountain slopes), the micro-climate, the temperature, light (particularly the effect of the sun's rays), orography, radio-activity of the water, geological factors, constructions of decorative lakes etc., the effect of depth of the water and the capacity of the snails for osmoregulation. S.W.

(63b) Deschiens continues his study of the habitats of schistosome vectors with a survey of the chemical factors affecting them. He discusses the effect of *p*H, dissolved gases and mineral content and compares the requirements of *Bulinus contortus* and *Planorbis glabratus* and their tolerance of various salts. He divides the biotic factors into five groups and in this paper considers the food and nutrition of the molluscs and the flora and fauna of the "climax", i.e. the aggregate of plant and animal associations forming the population of the relatively stable fresh-water environment in which the snails live. S.W.

64—Annales de Parasitologie Humaine et Comparée.

a. EUZET, L., 1957.—" La larve gyrodactyloide nageante de *Calicotyle kröyeri* Diesing 1850 (Trematoda—Monogenea)." **32** (3), 197–199.
b. GOLVAN, Y. J., 1957.—" Acanthocéphales d'oiseaux. Septième note. *Gordiorhynchus* (*Gordiorhynchus*) *madagascariensis* n.sp. parasite d'un rapace *Polyboroides madagascariensis*." **32** (3), 200–207.
c. DEBLOCK, S., CAPRON, A. & BIGUET, J., 1957.—" Contribution à la connaissance d'*Asymphylodora tincae* (Modeer 1790)." **32** (3), 208–218.
d. TIMON-DAVID, J., 1957.—" Recherches expérimentales sur le cycle évolutif d'un trématode du genre *Urotocus* Looss (Digenea, Leucochloridiidae)." **32** (3), 219–242.
e. CHABAUD, A. G. & GOLVAN, Y. J., 1957.—" *Megalobatrachonema campanae* n.sp. (Nematoda Kathlaniinae) parasite de tritons de la région parisienne." **32** (3), 243–263.
f. CHABAUD, A. G. & ROUGEAUX, M., 1957.—" Remarques sur la dentition de *Syngamus trachea* (Montagu) et sur la place systématique des syngames." **32** (3), 264–266.
g. THÉODORIDÈS, J., 1957.—" Sur un nouveau nématode parasite d'un mollusque gastéropode d'Indonésie *Alaninema venmansi* n.gen., n.sp. (Nematoda, Drilonematoidea)." **32** (3), 267–270.
h. GALLIARD, H., 1957.—" La filariose à *Wuchereria malayi* dans la péninsule malaise et en Inde (Travancore)." **32** (3), 271–285.
i. GOLVAN, Y. J. & LARIVIÈRE, M., 1957.—" Aspects des microfilaires de *Wuchereria bancrofti* dans les étalements de culots de centrifugation urinaires." **32** (3), 286–289.
j. CHABAUD, A. G., 1957.—"Synonymie de *Dipetalonema blanci* et de *Litomosa vite*." **32** (3), 342–343.
k. CHABAUD, A. G., 1957.—" Note sur les nématodes du genre *Desmidocercella*." **32** (3), 343–347.
l. GALLIARD, H., 1957.—" Prophylaxie de la filariose à *Wuchereria bancrofti* à Tahiti." **32** (3), 348–351.

(64a) Euzet found that eggs of *Calicotyle kröyeri*, kept in sea water, changed every 48 hours, at a temperature of 14°C. to 16°C. hatched at 24 or 25 days. The larva is very actively swimming, ciliated, dorso-ventrally flattened and when extended is 225 μ long and 60 μ broad. There is a large adhesive organ, with 14 hooks, which occupies most of the posterior third of the body. In the anterior third there are two short dorsal zones without cilia and near these are two pairs of eye spots; the pharynx lies behind the posterior pair. The resemblance of this larva to that of *Benedenia melleni* is striking. S.W.

(64b) Golvan describes and illustrates *Gordiorhynchus* (*Gordiorhynchus*) *madagascariensis* n.sp. from about 60 specimens obtained from *Polyboroides madagascariensis*. The new species is very large, the male being 26–33 mm. long and 0·7 mm. broad and the female 47–58 mm. long and 1·5 mm. broad. It may be distinguished from *G.* (*G.*) *magnus*, which has 14 to 17 true hooks and 9 to 12 spines per row, by having 7 to 9 true hooks, three of which are transitional between hooks and spines and 17 spines, and from *G.* (*G.*) *falconis* by the change from hooks to spines which is gradual in *G. falconis* and abrupt in the new species. S.W.

(64c) Deblock *et al.* quote and reproduce illustrations from published descriptions of *Asymphylodora tincae* (Modeer, 1790) and compare these with the morphology of specimens obtained by them from *Tinca tinca* in the Somme and Indre-et-Loire. They conclude that

their material, although very close to *A. tincae*, is distinct and, possibly, a different species; they propose the name *A. tincae* var. *media-glabra*. The outstanding characteristics are the presence of a smooth area, between the suckers, in which fine gland pores are seen to open and the junction of the two spermiducts to form a single well differentiated deferent duct. *Cercariaeum squamosum* Fuhrmann, 1916 corresponds exactly with this trematode. S.W.

(64d) Timon-David fed eggs of *Urotocus tholonetensis* to *Helicopsis arenaria*; 75% to 87% of the snails became infected. The miracidium was not observed, the eggs hatching n the digestive tract. Branched, unpigmented sporocysts developed rapidly in the hepatopancreas; cercariae which are tail-less, of the *Leucochloridium* type and provided with cephalic glands, developed directly in the branches, there being no redial stage; they encyst, becoming metacercariae, while still within the sporocyst and are invaginated in a very characteristic fashion. The first metacercariae were observed 125 days after the infective feed and the whole cycle in the snail takes about 150 days. Attempts to infect young chickens, pigeons and sparrows were unsuccessful but natural infections in young magpies allowed observations of very young stages, little more developed than metacercariae. The life-history is compared with that of *Leucochloridium* and the paper is illustrated by numerous line drawings and photomicrographs. S.W.

(64e) Chabaud & Golvan describe and figure *Megalabatrachonema campanae* n.sp. from *Triton vulgaris* and *T. alpestris*; the new species may be distinguished from *M. nipponicum*, the only other member of the genus, by the size and form of the oesophagus and the extremely short tail in the female (330 μ). They agree with Freitas & Lent that *Falcaustra* should be used in preference to *Spironoura* as the type species of the latter appears to be a nomen nudum. The species of *Falcaustra* are reviewed and the genera *Dibulbiger* and *Zanclophorus* are considered to be synonyms of *Falcaustra*. In the subfamily Kathlaniinae they include *Tonaudia*, *Kathlania*, *Spectatus*, *Amblyonema*, *Megalobatrachonema* and *Falcaustra* and provide an emended version of the key to these genera given by Freitas & Lent. *Dibulbiger longispiculis* is renamed *Falcaustra caballeroi* nom.nov., *Spironoura cryptobranchi* sensu Bravo & Caballero, 1940 *nec* Walton, 1930, *nec* Mackin, 1936 is renamed *F. mexicana* nom.nov. and *F. waltoni* is shown to be a synonym of *F. mackini*. S.W.

(64f) Chabaud & Rougeaux have studied the dentition of 50 adult *Syngamus trachea*. They found five types, (i) with six teeth (in three females and two males), (ii) with seven teeth of which one was dorsal (in two females and two males), (iii) with seven teeth of which one was ventral (in four females and six males), (iv) with eight teeth (in 20 females and ten males) and (v) with nine teeth (in one male). The significance of this variability is discussed. S.W.

(64g) *Alaninema venmansi* n.g., n.sp. from the mantle cavity of *Amphidromus contrarius* in Indonesia is described and figured. The new genus may be distinguished from other genera of the Drilonematoidea by its lack of large caudal phasmids and by its host, other members of the superfamily being parasites of the gonads of oligochaetes. S.W.

(64h) Galliard records his observations, made during 1955 and 1956, on the epidemiology of filariasis in Malaya and Travancore. In Malaya *Wuchereria malayi* is the dominant species, occurring in three types of zone each with its own vectors, whereas *W. bancrofti* is rare and almost entirely confined to Indian and Chinese immigrants. In Travancore *W. malayi* predominates in the rural areas and *W. bancrofti* in the towns. There is a correlation between the species and the type of filarial disease, *W. malayi* causing elephantiasis of the legs, which does not normally extend above the knee, and *W. bancrofti* causing hydrocele and other genital symptoms. In Travancore the distribution of *W. malayi* is restricted by geological and economic conditions but in some of these restricted zones 20% of the inhabitants have elephantiasis and there is a direct relationship between the frequency of symptoms and the degree of microfilaraemia. Children were infected from the age of three months and elephantiasis was observed in a ten-year-old boy. Galliard concludes that the correlation

between parasitism and filarial disease is demonstrated beyond any shadow of doubt in Travancore. White races are as susceptible as the autochthonous persons to the disease when the degree and duration of exposure are comparable. In Malaya the elimination of filariasis would be difficult, if not impossible, for biological and geographical reasons, whereas in Travancore it should be comparatively simple, but the psychological and economic barriers appear to be even more insurmountable than the natural barriers in Malaya. S.W.

(64i) Golvan & Larivière describe the appearance of microfilariae of *Wuchereria bancrofti* from the urinary sediment of a patient suffering from chyluria. The microfilariae were quite different in appearance from those normally observed in thick blood films and resembled, and could have been confused with, those of *Loa loa*. S.W.

(64j) From examination of material from naturally infected *Rhombomys opimus*, Chabaud concludes that *Dipetalonema blanci* and *Litomosa vite* are synonymous and should be designated as *Dipetalonema vite* (Krepkogorskaya, 1933) n.comb. S.W.

(64k) Chabaud, having now been able to study Gushanskaya's analysis of Dubinin's work on the synonymy of *Pharyngosetaria*, emends the conclusions he and Choquet published in 1955 [for abstract see Helm. Abs., **24**, No. 460b]. He agrees that *Pharyngosetaria* is a synonym of *Desmidocercella*; this genus now contains three species, *D. numidica*, *D. incognita* and *D. australis*. *Desmidocerca* and *Desmidocercella* are too closely related to be placed, as they were by Dubinin, in the spirurids and filariae respectively and are therefore both included in the family Desmidocercidae Cram, 1927. S.W.

(64l) Galliard reports on a control campaign against filariasis bancrofti in Tahiti. Prophylactic measures consisted of treatment of human carriers with hetrazan, in order to reduce the microfilaraemia, and attack on *Aëdes polynesiensis*. Treatment with D.D.T. powder around the huts reduced the potential transmission but the effect was only of short duration (a maximum of three months) and in some cases proved impracticable. Although the hetrazan treatment caused a marked drop in the index of infection of the mosquitoes this treatment would need to be continued for ten years before it was effective in eradicating the disease. S.W.

65—Annales de la Société Belge de Médecine Tropicale.

a. BEECKMANS, G., 1957.—" Un cas d'anémie grave chronique due à une ankylostomiase rebelle." **37** (1), 123–126. [English, German, Spanish & Flemish summaries pp. 125–126.]
b. SACRÉ, J. & DUBOIS, A., 1957.—" Subocclusion intestinale à *Schistosoma mansoni*." **37** (1), 147–150. [English, German, Spanish & Flemish summaries p. 149.]
c. FAIN, A. & VANDEPITTE, J., 1957.—" Description du nouveau distome vivant dans des kystes ou abcès rétroauriculaires chez l'homme au Congo belge." **37** (2), 251–258. [English, German, Spanish & Flemish summaries pp. 255–257.]
d. NINANE, G., BRAKEL, J. & COSTER, P. DE, 1957.—" A propos de l'emploi de l'adipate de pipérazine pour le traitement de masse de l'ascaridiose." **37** (2), 279–284. [English, German, Spanish & Flemish summaries pp. 283–284.]
e. VANDEPITTE, J., JOB, A., DELAISSE, J. & TABARY, M. J., 1957.—" Quatre cas d'abcès rétro-auriculaires chez des Congolais, produits par un nouveau distome." **37** (2), 309–315. [English, German, Spanish & Flemish summaries pp. 314–315.]

(65a) Intense anaemia, associated with a hookworm infection in a child 11 months old, failed to respond to transfusions, intramuscular iron and oil of chenopodium but yielded to tetrachlorethylene followed by intramuscular iron and antimalarial treatment. R.T.L.

(65c) An adult fluke belonging to the family Achillurbainiidae was removed from a subcutaneous abscess, located behind the ear of a native of the Kasai region of the Belgian Congo. It is described, illustrated and again named *Poikilorchis congolensis* n.g., n.sp. [this name has already appeared in *Nature*, 6th April 1957, see Helm. Abs., **26**, No. 27f]. This genus differs from *Achillurbainia* in having very markedly lobed and very irregular testicles numbering about 2 o which do not extend in front of the acetabulum, a small bilobed seminal

vesicle and an ovoid ovary. The genital pore is slightly paramedial and the caeca have many, but very short, bends. The eggs resemble those of *Paragonimus westermanii* but are much smaller, and are similar to those seen in the cases of pulmonary paragonimiasis previously reported from the Belgian Congo, Cameroons and Nigeria. R.T.L.

(65d) For mass treatment of ascaris infections, a single dose of piperazine adipate, at the rate of 200 mg. per kg. body-weight, given in the afternoon and followed next morning by castor oil is recommended. A complete cure can be anticipated in 94% of those treated. R.T.L.

(65e) Four cases in which retro-auricular cysts contained pus, in which there were numerous operculated eggs considerably smaller than those of *Paragonimus* are reported from Ipamu in the Belgian Congo. A photograph of the eggs is reproduced. A fully grown parasite obtained from one of the cysts is stated to be different from *Paragonimus westermanii* [see Helm. Abs., **26**, Nos. 27f and 65c above]. Earlier records of cases of pulmonary paragonimiasis at Ipamu and in British East Africa are quoted and it is pointed out that in every instance the diagnosis was based on the findings of eggs only. R.T.L.

66—Annals of Internal Medicine.

a. SCHICK, R., RITTERBAND, A. B. & LIEBERMAN, A. H., 1957.—" Fuadin therapy of schistosomiasis associated with ventricular tachycardia and death: a case report." **46** (2), 392–403.

67—Annals of Tropical Medicine and Parasitology.

a. CHODNIK, K. S., 1957.—" Aortic onchocerciasis due to *Onchocerca armillata* in cattle in Ghana, with special reference to the morphology of the parasite." **51** (2), 216–224.
b. KIRK, R., 1957.—" The pathogenesis of some tropical splenomegalies." **51** (2), 225–234.

(67a) During autopsies on 450 cattle reared on the savannah of the Northern Territories of Ghana, Chodnik found aortic lesions, of varying severity, which were caused by *Onchocerca armillata*. The morphology of the parasite and the lesions produced are described and illustrated. Both small and large nodules were frequently seen, the latter resembling those ascribed to *Elaeophora poeli*. The species of *Onchocerca* are difficult to differentiate, but *O. armillata* is distinguishable by the length of the oesophagus, which averages 3 mm., the prominent caudal papillae, of which two pairs are lateral to the anus, and the wide caudal alae of the male. R.T.L.

(67b) Kirk reviews some of the common forms of tropical splenomegaly in the light of modern concepts of the physiology and pathology of the spleen, dealing in turn with hypersplenism in kala-azar, Egyptian splenomegaly, Bengal splenomegaly and cryptogenetic splenomegaly in the Far East. Although Egyptian splenomegaly is generally regarded as a secondary effect of bilharzial cirrhosis of the liver, Kirk points out that malaria is usually endemic in the same areas. R.T.L.

68—Archives de l'Institut Pasteur de Tunis.

a. CHABAUD, A. G., 1957.—" Nématodes parasites d'oiseaux en Tunisie. Collection C. Vermeil." **34** (1), 155–166.
b. VERMEIL, C., 1957.—" État actuel des recherches schistosomo-malacologiques en Tunisie. Le foyer de bilharziose vésicale du seuil de Gafsa." **34** (1), 167–185.

(68a) Chabaud identifies six species of nematodes in this collection from birds in Tunisia. These are: *Subulura subulata*, *Habronema spinosa*, *Sicarius dipterum*, *Viguiera euryoptera*, *Hamatospiculum cylindricum* and a larva of *Hartertia* sp., probably *H. obesa*; a larval spirurid which could not be identified was also present. He redescribes and illustrates *Subulura subulata*, his specimens agreeing well with Seurat's description save that the spicules measured 0·96 mm. and 1·54 mm. instead of 1·2 mm. and 1·8 mm. and the vulva 5 mm. instead of

4·3 mm. He redefines *Viguiera* and *Serticeps*, which are very closely related, redescribes *Viguiera euryoptera* and transfers *S. buckleyi* and *S. osmanhilli*, both described by Yeh in 1954, to *Viguiera*. S.W.

(68b) Vermeil studied, during 1955 and 1956, the endemic focus of schistosomiasis haematobia in the area of Gafsa. Examination of schoolchildren confirmed the permanence of a general infection and the very great intensity of infection in the locality of Sidi Mansour. The distribution of *Bulinus truncatus* throughout the year has been investigated and it has been confirmed that in Sidi Mansour, infection with *Schistosoma haematobium* can occur throughout the year. New localities for *B. truncatus* were recorded at Ksar and Lalla. The paper is illustrated with maps and tables showing the hydro-geology, temperature variation, salinity of the water, etc. S.W.

69—Australian Journal of Experimental Biology and Medical Science.

a. BEARUP, A. J., 1957.—" Experimental vectors of the first larval stage of *Dibothriocephalus latus* (Cestoda) in Australia." **35** (2), 187–191.

(69a) *Dibothriocephalus latus* is occasionally found in Australia in immigrants from Europe but has not yet become established as an endemic infection. Experiments resulted in the development of coracidia in *Boeckella minuta* and *Gladioferens brevicornis*. Only early stages were obtained with *Mesocyclops leuckarti*, *Leptocyclops agilis*, *Cyclops varicans*, *Platycyclops* sp. *Pachycyclops annulicornis*, *Halicyclops aequoreus* and an unknown species of Cyclopoida. Efforts to infect the fishes *Gambusia affinis*, *Atherinosoma microstoma* and *Carassius auratus* were unsuccessful. The *Dibothriocephalus* previously reported from dogs in New South Wales as *D. latus* is believed by Bearup to belong to the genus *Spirometra*. R.T.L.

70—Australian Journal of Science.

a. BEARUP, A. J., 1957.—" Schistosomes in the nasal passages of aquatic birds." [Correspondence.] **19** (4), 163.

b. POLLAK, J. K., 1957.—" The uptake and utilization of ammonium ions by the parasitic roundworm *Ascaris lumbricoides*." **19** (5), 208–209.

(70a) Eggs of *Trichobilharzia* sp. were present in the nasal mucus of a teal duck, *Anas gibberifrons*, from the Riverina District of New South Wales. As similar occurrences have been reported from water birds in the Belgian Congo it may not have been previously looked for in Australia. No adults were found but bather's itch due to *Cercaria parocellata*, the larval form of a *Trichobilharzia*, is common in inland Australia. R.T.L.

(70b) When *Ascaris lumbricoides* was kept in Baldwin & Moyle's non-nutrient medium to which ammonium ions had been added in the form of 25 mg. of ammonium chloride per 125 ml. of the medium, the ovaries maintained their normal contents of free ammonia and non-protein amino-acid. In the absence of added ammonium ions these contents fell and alanine was the amino-acid most markedly affected. M.MCK.

71—Australian Journal of Zoology.

a. MACKERRAS, M. J., 1957.—" Observations on the life history of the cat lungworm, *Aelurostrongylus abstrusus* (Railliet, 1898) (Nematoda: Metastrongylidae)." **5** (2), 188–195.

(71a) The development of *Aelurostrongylus abstrusus* has been followed experimentally in *Agriolimax laevis*, an intermediate host in Queensland, and in the cat, its definitive host. The larval stages are figured and described. In the slug two moults occur. In the cat the third-stage larvae undergo a third and fourth moult in the lungs. By the 28th day after infection adults were found in the finer bronchioles and a few eggs were scattered throughout the lungs. First-stage larvae first appeared in the faeces 37 days after infection and in considerable numbers by the 41st day. On two occasions encysted larvae were found in the omentum. When mice were fed on infected slug material large numbers of third-stage larvae were found encysted in the omentum. These proved infective to a kitten. Thus mice act as storage hosts. To

cats they are more acceptable than slugs. Although the descriptions of the adults given by workers in various parts of the world agree fairly well, several small differences in morphology and rate of development are noted. These may indicate that different races of *A. abstrusus* are evolving in different continents. R.T.L.

72—Australian Veterinary Journal.

a. GORDON, H. McL., 1957.—" Studies on anthelmintics for sheep. Piperazine compounds." **33** (1), 1–7.
b. GEMMELL, M. A., 1957.—" Hydatid disease in Australia. 1. Observations on the incidence of *Echinococcus granulosus* (Batsch 1786) (Rudolphi 1805) in the dog in New South Wales." **33** (1), 8–14.

(72a) Piperazine-1-carbodithioic betaine (Safersan) was generally very effective against *Haemonchus contortus* in sheep when 4 gm. were injected into the abomasum or 10 gm. were administered after swabbing the mouth with a 10% copper sulphate solution. When 4 gm. of the compound were injected into the rumen, *Oesophagostomum columbianum* and *O. venulosum* infections were removed from all of three sheep. Piperazine salts, including piperazine diacetate, were also efficient when thus administered against these two species. A mixture of 1 gm. of copper sulphate and 4 gm. of piperazine hexahydrate in 30 ml. of water injected into the abomasum of two sheep was 100% effective against both *H. contortus* and *O. columbianum*. Piperazine compounds had little effect on *Chabertia ovina*, *Trichuris ovis* and *Trichostrongylus colubriformis* but Gordon has found carbon bisulphide effective against *T. colubriformis* if injected at a dose of 3 ml. into the abomasum. He has also found it effective against *H. contortus*. Mixtures of piperazine hexahydrate, copper sulphate and/or nicotine sulphate were of some value but those including nicotine sulphate were toxic. M.McK.

(72b) Dogs from different localities and occupation in New South Wales were examined for *Echinococcus* infection either post mortem or by faecal examination after treatment. Among 524 dogs associated with the pastoral or meat industries the incidence was 25·6%. Most dogs harboured one or more species of tapeworms. *Echinococcus* infection could be successfully diagnosed by shaking the stool in water in a large jar covered with wire gauze, 100 mesh to the inch. When thoroughly broken down, the sample was washed with tap-water run through the wire gauze for up to 30 minutes. All segments and scolices remained in the jar. No decrease in over-all incidence was observed in this survey as compared with figures from 1925 to 1929. Among rabbiting dogs, 1 in 35 was then found infected and the incidence now recorded is 19·1%. This is attributable to the increased feeding of sheep offal as rabbits are scarce due to myxomatosis. One dog passed over 28,000 *Echinococcus* after treatment. M.McK.

73—Boletín Chileno de Parasitología.

a. JARPA, A. & MATURANA, V., 1957.—" Un caso clínico de estrongyloidosis humana." **12** (1), 12–13. [English summary p. 12.]
b. NIEDMANN, G. & DONCKASTER, R., 1957.—" Un caso de ascaridiasis coledociana en el adulto." **12** (1), 14–15. [English summary p. 14.]

(73a) Gentian violet, by the mouth and by intubation, failed to cure a chronic case of *Strongyloides stercoralis* infection in a North American patient. R.T.L.

(73b) An *Ascaris lumbricoides* which blocked the bile-duct was surgically removed from a case of chronic lithiasis of the gall-baldder. R.T.L.

74—British Medical Journal.

a. DANARAJ, T. J., 1957.—" Tropical pulmonary eosinophilia." [Correspondence.] Year 1957, **2** (5037), 161–162.

(74a) Danaraj has in preparation a report on 110 cases of eosinophilic lung showing that diethylcarbamazine had a specific action which compared very favourably with that of organic arsenicals yet the blood films, taken at night, were negative for microfilariae. Twelve

cases tested for complement fixation with *Dirofilaria immitis* antigen were all positive. The aetiological possibility of filarial infection, not necessarily human, should be considered in view of the sensitivity of cases of eosinophilic lung to filarial proteins and the response to diethylcarbamazine. R.T.L.

75—British Veterinary Journal.

a. OLDHAM, J. N. & BERESFORD-JONES, W. P., 1957.—" *Trichinella spiralis* in the wild red fox in England." **113** (1), 34–35.
b. SARWAR, M. M., 1957.—" Cerebro-spinal setariasis." **113** (7), 295–296.

(75a) Encapsulated *Trichinella spiralis* larvae were found in a wild red fox from near Truro in Cornwall, apparently for the first time in England. G.I.P.

(75b) Sarwar draws attention to the fact that Place, in Burma, appears to have recognized a causal relationship between ocular setariasis and "Kumri" as early as 1911. Cerebrosetariasis has been observed by Sarwar in bullocks and horses in Punjah-Pakistan. R.T.L.

76—Bulletin de l'Académie Nationale de Médecine. Paris.

a. DESCHIENS, R., 1957.—" Les incidences nosologiques des engagements de parasites d'animaux chez l'homme." 3e Série, **141** (5/6), 114–119. [Discussion pp. 119–120.]

(76a) Deschiens cites several helminth species which have been found experimentally to provoke disease in animals in which they cannot develop and reviews the causes and pathology of swimmer's itch, creeping eruption and visceral larva migrans in man. To such diseases he applies the name, given by Harant, of "impasses parasitaires". M.McK.

77—Bulletin de l'Institut Français d'Afrique Noire. Série A: Sciences Naturelles.

a. DOLLFUS, R. P. & GOLVAN, Y. J., 1957.—" Le genre *Centrorhynchus* Lühe 1911 (Acanthocephala—Polymorphidae). (Note rectificative)." **19** (2), 412–416.
b. CAMPANA-ROUGET, Y., 1957.—" Parasites de poissons de mer ouest-africains récoltés par J. Cadenat. Nématodes (4e note). Sur quelques espèces de Cucullanidae. Révision de la sous-famille." **19** (2), 417–473.

(77a) Dollfus & Golvan draw attention to a number of errors which appeared in a paper published by Golvan in 1956 in *Bull. Inst. franç. Afr. noire*, Série A, **18**, 732–791, and also to the fact that the name *Centrorhynchus* Lühe, 1911 is preoccupied. As *Centrorhynchus* and *Gordiorhynchus* have been shown to be synonymous the correct name for this genus is now *Gordiorhynchus* with *Echinorhynchus*, *Paradoxites*, *Chentrosoma* sensu Porta, 1909 and *Centrorhynchus* as synonyms. By the laws of zoological nomenclature the subgenus which contains the generic type must take the generic name; therefore the subgenus *Longirostris* becomes *Gordiorhynchus*. *Gordiorhynchus* now contains two subgenera, *Gordiorhynchus* and *Sphaerirostris*. S.W.

(77b) Amongst these Cucullanidae Campana-Rouget found two new species and three which she regards as species inquirendae as only the females were present. *Cucullanus gendrei* n.sp. occurred in *Synacium micrurum*; it is very similar to *C. pleuronectidis*, differing mainly in the length of the tail and thickness of the cuticle. *C. murenophidis* n.sp. is described from one male specimen from *Murenophis robusta*; although it is believed to be new the diagnosis from a single specimen is difficult to establish. *Cucullanellus*, *Dichelyne* and *Neocucullanellus* are suppressed. *Cucullanus interrogativus*, *Dacnitoides robusta*, *Dichelyne laticeps* and *Neocucullanellus apharei* are transferred to *Neocucullanus*. *Dacnitis occidentalis* is shown to be a synonym of *D. truttae*, and *Cucullanus schubarti* of *C. pauliceae*. *C. australiensis* is considered to be a variety of *C. hians*, *C. heterodonti* is replaced in *Dacnitis*, *C. smedleyi* nom.nov. is proposed for *C. elongatus*, *C. lintoni* is divided into three species, *C. lintoni*, *C. fastigatus* and *C. cylindricus*, and *C. stossichi* into at least two species. *C. serratus* of Törnquist, 1931 is

considered to be a distinct species and named *C. niloticus*. There is a key to the valid genera, a classification under host species, a table of comparative measurements and a comprehensive bibliography. S.W.

78—Bulletin de la Société de Pathologie Exotique.

a. DESCHIENS, R., MOLINARI, V. & BERTRAND, D., 1957.—" Sur l'action molluscocide de l' 'eau de zinc'." **50** (1), 59–61. [Discussion p. 61.]
b. DESCHIENS, R. & MOLINARI, V., 1957.—" Sur l'action molluscocide de la grenaille de zinc." **50** (1), 62–65.
c. RUFFIÉ, J., 1957.—" Sur la périodicité des microfilaires sanguicoles de Guinée Portugaise." **50** (1), 65–69.
d. DESCHIENS, R. & BÉNEX, J., 1957.—" Essais expérimentaux et cliniques de traitement de l'anguillulose intestinale par le sous-nitrate et par le carbonate de bismuth." **50** (1), 70–74. [Discussion p. 74.]
e. BRUMPT, L. C., DANVOYE, Y. & NGETH, L., 1957.—" Comparaison entre les voies d'administration buccale et rectale de sels ferreux dans le traitement de l'anémie ankylostomique." **50** (1), 75–78.
f. ANDRAL, L., 1957.—" Deux cas de spirocercose canine observés en Éthiopie." **50** (1), 78–79.
g. CASILE, M. & FLOCH, H., 1957.—" Sur l'éosinophilie tropicale." **50** (1), 90–94.
h. GOLVAN, Y. J., 1957.—" Les principales techniques de coloration des microfilaires sanguicoles." **50** (1), 143–157.
i. DESCHIENS, R., 1957.—" Sur la perpétuation des élevages des mollusques vecteurs des bilharzioses à l'obscurité." **50** (2), 229–233.
j. BAILENGER, J., 1957.—" Fréquence des localisations hydatiques chez l'homme et le bétail." **50** (2), 308–314.
k. D'HAUSSY, R., PFISTER, R., RIT, J. M. & BRETEAU, G., 1957.—" Note sur les relations de l'onchocercose et de la syphilis au Soudan." **50** (2), 314–321.

(78a) When 10 gm. or 25 gm. of granulated zinc were soaked per litre of water at 25°C. for four days, the filtrates, containing 1·1 mg. and 2·2 mg. of zinc per litre respectively, were lethal to *Planorbis glabratus* and *Bulinus contortus* in about two to four days. The fish *Carassius auratus* was placed in a solution of 1·1 mg. per litre and was unaffected. *Elodea* in the same aquarium faded and wilted. M.McK.

(78b) *Planorbis glabratus* and *Bulinus contortus* were killed after about 24 hours in aquaria containing five litres of water and 20 gm. of granulated zinc or 20 gm. of zinc and 20 gm. of copper turnings. Those in the control aquarium also died. By repeating the experiments of Lagrange (reported in *Arch. int. Pharmacodyn.*, **91**, p. 185) Deschiens & Molinari confirmed that 20 gm. of copper turnings in such aquaria also killed the molluscs in 24 hours. Lagrange has observed that aqueous solution of 10^{-11} of copper hydroxide is lethal to snails. M.McK.

(78c) Digital punctures of two carriers of *Wuchereria bancrofti*, two carriers of *Dipetalonema perstans* and one with both infections in Portuguese Guinea, were taken every three hours for 36 hours. The usual nocturnal periodicity for *W. bancrofti* and absence of periodicity for *D. perstans* were observed even in the carrier with mixed infections. M.McK.

(78d) All of five cases of *Strongyloides stercoralis* infection were still negative three months after the end of the following course of treatment: 1st to 8th day, 15–20 gm. of bismuth subnitrate given orally in 100 c.c. of milk after breakfast; 9th to 15th day, tablets containing 0·5 gm. of stannous oxide given at the rate of one at breakfast, two at lunch and one at supper; repetition of these treatments for two or three months continuously. (In the discussion Girard advocates withholding judgement on the cure of these cases of repatriated Europeans and recalls a patient whose manifestations of *S. stercoralis* infection disappeared each time he returned to France.) Preliminary tests with strongyloid and rhabditoid larvae of *S. stercoralis* and *S. fülleborni* on media of three parts by weight of rabbit faeces, one part of the test compound, and a sprinkling of infected faeces, had shown that bismuth subnitrate was 100% effective, bismuth carbonate rather less effective and stannous oxide partially effective in checking larval development. M.McK.

(78e) The rectal administration of *d*-dehydroxyferrigluconic acid to four children with hookworm anaemia on the day after worming and for a period of 12 to 14 days was ineffectual although subsequent oral administration of iron and, in another case, ferrous sulphate was effective. M.MCK.

(78g) No evidence of filarial infection could be found in two cases of tropical eosinophilia seen in French Guiana. One, in which the presence of *Wuchereria bancrofti* was nevertheless suspected, was finally cured by consecutive treatments with cortisone, Stovarsol and hetrazan. M.MCK.

(78h) Golvan describes those methods which have been found easiest and most reliable for staining thick blood smears of human-type microfilariae at the Institute of Parasitology of the Faculty of Medicine in Paris. He illustrates these microfilariae, enumerates the characters which are to be sought in their diagnosis and discusses the advantages and disadvantages of staining when larvae are alive or fixed. A table shows the colour given by different stains to microfilarial structures and another compares the differential characters as they appear in each species when stained with Giemsa. M.MCK.

(78i) During the period of a year in which *Bulinus truncatus* (=*B. contortus*) were kept in the dark they reproduced, but there were only 18 or 19 molluscs in each aquarium where there had originally been 20. The mortality of the original stock was however 30% higher than that of the controls in the first 89 days and 50% of the mollusc eggs aborted whereas scarcely any did so among the controls. Although the mortality of juveniles in the dark reached about 90%, those which survived were able to mate. Deschiens agrees that canals, wells, drains and the like should be covered in schistosome infected areas and suggests that their treatment should be included in schemes for molluscan control. M.MCK.

(78j) Bailenger attributes the rising human incidence of pulmonary hydatid solely to improved techniques and increased examination of the chest. Of 134 cases which he encountered from 1948 to 1953, 66 showed a hepatic and 52 a pulmonary localization. The figures he gives from abattoirs in important towns in south-west France show a predominant hepatic localization in cattle, sheep and pigs and his calculations based on published statistics on rejected viscera in Tunisia and Uruguay give incidences of 43% to 61·3% in the lung and 38·7% to 57% in the liver. M.MCK.

(78k) The classical concept that filarial infections give false positive reactions in serum tests for syphilis was not borne out in a study of 448 inhabitants of villages on the river Baoulé (French Sudan) where *Onchocerca volvulus* infection accompanies a very high incidence of syphilis. Of 362 persons examined by Kolmer's modification of the Wasserman technique, for example, the sera were positive in 63% of the 293 with Onchocerca infection and in 69% of the 69 without Onchocerca infection. No relation was found between the presence of syphilis and the types of ocular lesions manifested by onchocerciasis. M.MCK.

79—Byulleten Eksperimentalnoi Biologii i Meditsini.

a. KRAVETS, N. P., 1957.—[The toxicity of oxygen to pig ascaris.] **43** (1), 85–88. [In Russian: English summary p. 88.]

(79a) When pig ascaris were placed at 22–24°C. in hermetically closed cylinders death occurred within 50 to 80 minutes in pure oxygen and after an average of six to seven hours in air. When a section of pig intestine containing ascaris was kept in physiological solution at 40–42°C. (simulating natural conditions) and filled with oxygen, the survival time of the worms was equivalent to that in the pure oxygen. The author suggests that death is due to the accumulation of hydrogen peroxide. G.I.P.

80—California Agriculture.

a. BAINES, R. C. & MARTIN, J. P., 1957.—" Fumigants for citrus nematode." **11** (6), 13–15.

(80a) Several fumigants for the control of citrus nematode, *Tylenchulus semi-penetrans*, are described. Baines & Martin give details of methods of application of the fumigants and describe the procedure for replanting with young citrus trees in the fumigated soil. H.R.W.

81—California Medicine.

a. LEE, G. Q. & HIRST, Jr., A. E., 1957.—" Clonorchiasis of the biliary tract. A report of two cases." **86** (1), 53–54.
b. LAVERS, G. D., 1957.—" Echinococcus cyst with intrabiliary rupture." **86** (4), 270–271.

82—Canadian Journal of Biochemistry and Physiology.

a. FRANK, G. B., 1957.—" The effects of trematode infection on the physiological activity of the frog." **35** (6), 347–356.

(82a) During investigations of the electrical properties of frog muscle it was found suddenly in the autumn of 1955, that all the available frogs had strigeid mesocercariae and metacercariae in the muscles. Muscles from parasitized frogs behaved quite differently from those from parasite-free frogs. In infected frogs the potassium and sodium ion concentrations in muscle and plasma were considerably higher than normal and the recorded potentials were initially low; when the infected muscles were kept in Ringer's solution the potentials tended to reach normal values. This indicates that the parasites do not have a direct effect on the muscle fibres but the water balance mechanism appears to be considerably upset by the presence of the trematodes. S.W.

83—Canadian Journal of Comparative Medicine and Veterinary Science.

a. CHOQUETTE, L. P. E., WHITTEN, L. K., RANKIN, G. & SEAL, C. M., 1957.—" Note on parasites found in reindeer (*Rangifer tarandus*) in Canada." **21** (6), 199–203. [French summary pp. 202–203.]

(83a) In one out of 24 *Rangifer tarandus* slaughtered at the Reindeer Depot, east of Aklavik, N.W.T., only a few *Ostertagia trifurcata* were present, but larval tapeworms were found in 773 out of 1,664 animals slaughtered there in 1953, 1954 and 1955, viz., *Cysticercus tarandi* in 12·8%, *C. tenuicollis* in 25·5% and hydatid cysts in 9·5%. Although the wolf is probably the important host of the adults of these tapeworms on the grazing ranges, dogs are probably also involved as loose dogs, belonging to native visitors and herders who attend the annual reindeer slaughtering operation, have access to the offal. R.T.L.

84—Canadian Journal of Zoology.

a. FREEMAN, R. S., 1957.—" Life cycle and morphology of *Paruterina rauschi* n.sp. and *P. candelabraria* (Goeze, 1782) (Cestoda) from owls, and significance of plerocercoids in the order Cyclophyllidea." **35** (3), 349–370.
b. GIBBS, H. C., 1957.—" The taxonomic status of *Rictularia affinis* Jägerskiöld, 1909, *Rictularia cahirensis* Jägerskiöld, 1909, and *Rictularia splendida* Hall, 1913." **35** (3), 405–410.
c. MULVEY, R. H., 1957.—" Taxonomic value of the cone top and the underbridge in the cyst-forming nematodes *Heterodera schachtii*, *H. schachtii* var. *trifolii*, and *H. avenae* (Nematoda: Heteroderidae)." **35** (3), 421–423.
d. RONALD, K., 1957.—" The metazoan parasites of the Heterosomata of the Gulf of St. Lawrence. I. *Echinorhynchus laurentianus* sp.nov. (Acanthocephala: Echinorhynchidae)." **35** (3), 437–439.
e. MAHON, J., 1957.—" *Deltokeras synallaxis* sp.nov. (Dilepididae) from *Synallaxis rutilans* Temm." **35** (3), 441–447.
f. MONTREUIL, P. L. J. & RONALD, K., 1957.—" A preliminary note on the nematode parasites of seals in the Gulf of the St. Lawrence." **35** (3), 495.

(84a) *Paruterina rauschi* n.sp. from *Strix varia*, *Bubo virginianus* and *Aegolius acadica* in southern Canada and U.S.A. has 26 to 32 testes whereas *P. otidis* has 15 and *P. angustata*

has 20. The large rostellar hooks are only about the size of the small hooks of *P. candelabraria* while the ovary and vitelline glands are usually larger. Mature *P. rauschi* were obtained from an owl fed 47 days previously with plerocercoids from mice which had been fed with eggs from ripe proglottides taken from a naturally infected owl. The growth of the plerocercoids is described and illustrated by photomicrographs. The plerocercoids of *Paruterina* sp. reported by Hall *et al.* (1955) from the liver of *Peromyscus leucopus* proved on examination to be those of *Paruterina rauschi*. The life-cycle of *P. candelabraria* was traced experimentally by feeding eggs from a naturally infected snowy owl to house mice, chipmunks, a white-footed mouse and a red-backed mouse. The various stages of growth of the plerocercoids are described. The infected rodents were fed to a great horned owl and strobilae were recovered from the owl 45 days later. The paper also deals with the reaction of the host to the presence of the plerocercoids, host specificity, geographical distribution and speculations on the character of the ancestral immature cyclophyllidean cestodes. R.T.L.

(84b) Owing to the marked similarity of the characters hitherto used to distinguish *Rictularia cahirensis* and *R. splendida* from *R. affinis* these names are regarded as its synonyms. R.T.L.

(84c) In *Heterodera schachtii* the fenestra on the lip tops are smaller and the depth of the underbridge is significantly greater than in *H. schachtii* var. *trifolii*. Although variations in the underbridge may render this difference of doubtful taxonomic significance, the two forms can be distinguished, for in *H. s. trifolii* it is less pigmented, more slender and the arms, or ends, are not bifurcated. In *H. avenae* the bullae are coarser and lie closer to the fenestra than in *H. schachtii* or *H. s. trifolii* and the cysts do not show any underbridge. R.T.L.

(84d) *Echinorhynchus laurentianus* n.sp. occurred in 46% of the marine fishes *Hippoglossoides platessoides*, *Hippoglossus hippoglossus*, *Pseudopleuronectes americanus* and *Scophthalmus aquosus* caught in the Gulf of St. Lawrence. It has 14–16 longitudinal rows of hooks on the proboscis whereas *E. gadi* has 18–22 rows. R.T.L.

(84e) *Deltokeras synallaxis* n.sp., from *Synallaxis rutilans* (Passeriformes) in Brazil, has six to eight testes thus differing from the five known species and from all except *D. delachauxi* in having irregularly alternating genital pores. Mahon discusses the taxonomic position of *Deltokeras*, rejects Deltokerinae Meggitt and Biuterinidae and, accepting Hsü's generic diagnosis, places this genus in Paruterininae. R.T.L.

(84f) In a preliminary investigation Montreuil & Ronald have found the Anisakinae of seals usually firmly adherent to the mucosa of the intestine in numbers as great as in the stomach. As the published incidence has usually been based on counts from the stomach there is a need for a reassessment of earlier records. R.T.L.

85—Canadian Medical Association Journal.

a. FFRENCH, G., 1957.—" The wider view: possibilities in the Canadian pattern of disease." **76** (3), 198–205.
b. HIRTE, W. E., 1957.—" Treatment of tapeworm infestation with a tin preparation." **76** (3), 219–220.

(85a) As in the future Canada may have to depend on immigrants from the Near and Far East and the West Indies to develop its resources to the full, the pattern of disease may change. It is therefore suggested that clinical history taking in all returning expatriates and new Canadians should include geographical, dietetic and epidemiological information. R.T.L.

(85b) Cestodin tablets consisting of 0·58 gm. of powdered tin, 32·5 mg. of tin chloride and 150 mg. of stannous oxide were given for five days to 202 patients, aged 9 to 82 years, with tapeworm infections. Adults received one tablet after each meal to a total of 15. The dosage for children aged 8 to 12 was one tablet twice daily. A saline purge preceded and

followed treatment in most cases. In the four months after treatment 22 patients relapsed or were reinfected. Of 16 given two or three courses of treatment, 12 remained infected. One person vomited too persistently to finish the treatment. Other toxic effects included colic and a sense of fullness in the abdomen. M.McK.

86—Central African Journal of Medicine.

a. JORDAN, P., 1957.—" The fevers of Africa. 5. Clinical Bancroftian disease in Tanganyika." **3** (1), 18–23.

(86a) The various clinical manifestations of Bancroftian filariasis, seen in Tanganyika, are briefly described and illustrated by photographs. Elephantiasis is considered to be less important in a community than hydrocele. Gland punctures in 22 persons with chronic filarial adenitis were all negative although 11 had microfilaraemia. R.T.L.

87—Ceylon Journal of Science. Section B. Zoology.

a. CRUSZ, H., 1957.—" A new anaporrhutine trematode, *Staphylorchis parisi* sp.nov. from the shark, *Scoliodon walbeehmi*." **25** (3), 193–195.

(87a) Crusz adds a third species to the genus *Staphylorchis*, viz., *S. parisi* n.sp. from the body-cavity of the shark *Scoliodon walbeehmi* from Indian and Ceylonese waters. It is closely related to *Staphylorchis gigas* but differs in lacking the prominent coil of the uterus between the ovary and the ventral sucker and in having a very large receptaculum seminis almost double the size of the suckers. It is also much larger in size (29–40 mm. × 21–30 mm.). A single specimen of *Staphylorchis*, from the same host, but smaller, broader than long and much more flattened and less fleshy than *S. parisi* is recorded as *Staphylorchis* sp.dub. R.T.L.

88—Ceylon Veterinary Journal.

a. FERNANDO, S. T., 1957.—" Cystitis in dog infected with *Spirocerca lupi*." **5** (1/2), 29–30.

(88a) Numerous eggs of *Spirocerca lupi* were passed in the urine by a golden Labrador dog suffering from cystitis. X-ray examination after the intravenous injection of Pyelosil revealed a nodule on the dorsal wall of the bladder. The oral administration of caricide was ineffective. Irrigation of the bladder with 25 c.c. of a 5% solution of caricide did not kill the parasites in this and several other cases. R.T.L.

89—China Reconstructs.

a. PAN, Y., 1957.—" Ending the scourge of schistosomiasis." **6** (8), 8–10.

(89a) A popular account is given of the effort now being made to eradicate *Schistosoma japonicum* in the Chingpu County of China. Night-soil jars when full were sealed with lime paste. This prevented the escape of natural ammonia which killed the schistosome eggs within a few days so that the night-soil could be safely applied to the ground as fertilizer. The washing of chamber-pots in the river was forbidden and tanks were provided for this purpose. The snail vectors along the river banks averaged 10 to 24 per square foot. These were killed by spraying the banks and surrounding land with calcium arsenate. Another method used was to take off the top soil and bury it in deep ditches. Snails on weeds near the banks were sprayed with burning hydrogen and carbon monoxide. This, it is estimated, proved 90% effective. Mass treatment with small doses of tartar emetic administered twice daily for three days reduced the period of hospitalisation to ten or 15 days. Vitamin B_1 alleviated the nausea and other reactions. Acupuncture was found to be effective in easing the reaction to tartar emetic in 89% of the cases. Tablets consisting chiefly of an extract of the roots of the Chinese tallow tree are reported, from another area, to be effective against the schistosomes. The Chinese Ministry of Health anticipates that the whole country will have been treated by August, 1962. R.T.L.

90—Chinese Medical Journal. Peking.

a. P'AN, J. S., HUANG, M. H., CHIANG, S. C., LU, C. W., HSÜ, C. Y. & HSÜ, C. M., 1957.—"Rectosigmoidoscopy in schistosomiasis japonica." **75** (1), 28–40.

91—Chronicle of the World Health Organization.

a. ANON., 1957.—"Control of bilharziasis." **11** (5), 159–162.

(91a) [A fuller account of this paper is published in *World Hlth. Org. Tech. Rep. Ser.*, 1957, No. 120, 38 pp. For abstract see No. 159a below.]

92—Deutsche Medizinische Wochenschrift.

a. HANSTEIN, H., 1957.—"Medikamentöse Behandlung des *Echinococcus multilocularis*." **82** (9), 316–317.

93—Deutsche Tierärztliche Wochenschrift.

a. KELLER, H. & QUEISSER, H., 1957.—"*Strongylus edentatus* unter dem Bauchfell von Pferden- und Fleischbeschau." **64** (11), 253–254.
b. HITZMANN, G., 1957.—"Über die Wurmbehandlung der Pferde mit Piperazinpräparaten." **64** (13), 308–310.
c. BEHRENS, H., 1957.—"Untersuchungen über den Wurmbefall bei Schweinen und seine Behandlung mit Piperazinadipat." **64** (16), 382–384.

(93a) Keller & Queisser urge that haemorrhages and larvae of *Strongylus edentatus* should be sought in the peritoneum of horses, particularly of fat horses, at slaughter. If the larvae are not immediately under the membrane, a small cut at the centre of the haemorrhage often allows them to be squeezed out. It is surprising that text-books on the inspection of meat and of animals for slaughter do not mention the wandering of these larvae. According to a dissertation by Queisser in 1955, 190 of 461 horses at the abattoir in Giessen had strongylid larvae in the peritoneum and these were of *S. edentatus* in all but one case. The concentration of the larvae on the right side was striking. The authors consider that careful inspection would show this infection to be a major cause of rejections of the peritoneum and the underlying fat. M.McK.

(93b) Each of 60 horses, treated with one of two commercial preparations of piperazine adipate, received a single dose of 10 gm. of the drug per 50 kg. body-weight up to a maximum dose of 80 gm., without dieting. Eight to ten days later the oxyurid infections had been cured in nine out of 11 and the faeces were negative for ascarid eggs in 29 of the 31 which had carried this infection and were negative for strongylids and all other helminths in 30 out of 56. No toxic effects were observed but horses with heavy ascarid burdens ate poorly for two or three days after treatment. One horse was given 240 gm. of the adipate without disturbance or apparent changes in liver functions or in the blood. M.McK.

(93c) Examination of 346 groups, each of four young pigs aged from two to seven months, revealed a 51% infection with ascaris and a 57% infection with "other gastro-intestinal nematodes". Infection with ascaris decreased with age; with other nematodes the reverse was the case. Administration of piperazine adipate in the fodder (which was readily eaten) at a rate of 250 mg. per kg. body-weight gave rise to no ill effects at all. Against ascaris, in 28 groups of four pigs, the treatment was 100% effective judged by faecal examination after 3–4 weeks; 7–8 weeks after treatment ova were recovered from 5 groups (19%). Against "other nematodes", examination after 3–4 weeks showed a 62% efficacy: after 8 weeks this was 38%. In 10 breeding sows the treatment was completely ineffectual. A.E.F.

94—East African Medical Journal.

a. McKINNON, J. A., 1957.—" The mass treatment of tapeworm with mepacrine." **34** (1), 15–18.

(94a) During routine inspection of latrine buckets at the works camp at Marigat, Baringo District of Kenya, it was noticed that a high percentage of the personnel were passing tapeworm segments. Subsequent examination of the stools of 1,120 individuals showed that 444 had visible segments and an additional 50 had tapeworm eggs without visible segments. These 494 men received 480 gm. of magnesium sulphate followed by 800 mg. of mepacrine by the mouth, divided into four doses at five minute intervals with sips of an antacid mixture between each dose to prevent nausea and one hour after the last dose a further 960 gm. of magnesium sulphate was administered. On the fourth day after treatment 42 still passed segments and an additional 70 had eggs in their faeces, but many of them were still passing stained segments on the fourth and fifth days after treatment. Re-examination later showed that only 13 were still passing segments and 48 others had tapeworm eggs in their faeces. These 61 cases were given a second course of treatment after which only one continued to pass segments and seven others had tapeworm eggs in their faeces. Three months later 200 of the original cases remaining in the camp were again examined. Of 170 who had had one course of treatment only 16 were still positive and of 30 who had received two courses of treatment two only were positive. Vomiting was the only adverse effect of the mepacrine and occurred in 12 cases. R.T.L.

95—Experimental Parasitology. New York.

a. VON BRAND, T., 1957.—" Recent trends in parasite physiology." **6** (3), 233–244.
b. LAURIE, J. S., 1957.—" The *in vitro* fermentation of carbohydrates by two species of cestodes and one species of Acanthocephala." **6** (3), 245–260.
c. DISSANAIKE, A. S., DISSANAIKE, G. A., NILES, W. J. & SURENDRANATHAN, R., 1957.—" Further studies on radioactive mosquitoes and filarial larvae using autoradiographic technique." **6** (3), 261–270.
d. SADUN, E. H., ALLAIN, D. & HEIMLICH, R., 1957.—" Quantitative determination of *Ascaris* eggs in clear suspensions by photonephelometry." **6** (3), 271–279.
e. READ, C. P. & ROTHMAN, A. H., 1957.—" The role of carbohydrates in the biology of cestodes. II. The effect of starvation on glycogenesis and glucose consumption in *Hymenolepis*." **6** (3), 280–287.
f. READ, C. P., 1957.—" The role of carbohydrates in the biology of cestodes. III. Studies on two species from dogfish." **6** (3), 288–293.
g. READ, C. P. & ROTHMAN, A. H., 1957.—" The role of carbohydrates in the biology of cestodes. IV. Some effects of host dietary carbohydrate on growth and reproduction of *Hymenolepis*." **6** (3), 294–305.
h. LA RUE, G. R., 1957.—" The classification of digenetic Trematoda: a review and a new system." **6** (3), 306–349.

(95a) This review deals chiefly with recent work on the carbohydrate chemistry, the culture and the intermediary metabolism of endoparasites. W.P.R.

(95b) Laurie found that *Oochoristica symmetrica* and *Moniliformis dubius*, like *Hymenolepis diminuta*, produced no metabolic gas in anaerobic conditions. Acid production in the presence of added substrate was therefore taken as evidence of fermentation. Under these conditions *H. diminuta* and *O. symmetrica* fermented glucose and galactose. *M. dubius* fermented glucose, galactose, mannose, fructose and maltose. The action of a number of inhibitors on these fermentations was examined. W.P.R.

(95c) Third-stage larvae of *Wuchereria bancrofti* and *Setaria digitata* were obtained with a radio-activity that would enable them to be traced in the definitive host. This was 174 β-counts per minute in the case of the *S. digitata* larvae. The larvae had been produced in respective vectors, *Culex fatigans* and *Armigeres obturbans* which had been kept for one to several days during the second to third larval stages in baths of P^{32} (orthophosphate) of activity 1 μc. per ml. In spite of the large dose of radiation to which the filarial larvae were

exposed in the mosquito their development was not seriously affected. To obtain autoradiographs, larvae of *S. digitata* were dried on a slide and covered with celloidin by dipping them in a solution of 1% in equal parts of ether and absolute alcohol; exposed to X-ray films at 2°C. and processed at 18°C. to 20°C. for 5–20 minutes in a solution of 3·5 gm. of amidol and 25 gm. of sodium sulphite crystals per litre, one minute in 0·5% acetic acid and ten minutes in hypo. M.McK.

(95d) Determinations of the concentrations of eggs of *Ascaris lumbricoides* var. *suis* in clear solutions of 33% glycerin in water were estimated, in an average of 30 seconds by using a photoelectric nephelometer whereas egg counts by the dilution method required five to 15 minutes, depending on the concentration; in the latter statistical analysis showed the counts to be more variable. From preliminary experiments it was concluded that the nephelometric readings (N) were proportional to the number of eggs per ml. and this last number (E) could be calculated by using the relation $E = bN$, where b was estimated, according to the method of least squares, by the formula $b = \frac{\Sigma NE}{\Sigma N^2}$. M.McK.

(95e) Read & Rothman fasted rats infested with *Hymenolepis diminuta* for 24 hours. The host animals were then fed 0·5 gm. of starch after which they were fasted and killed at intervals up to 48 hours. This treatment caused a decrease in the size and polysaccharide content of the parasites. *In vitro* experiments showed that, as the period of fasting increased, the ability of the worms to use glucose and synthesize glycogen was increased when calculated on a weight basis, but not when calculated per worm. *Hymenolepis citelli* in the hamster was reduced in weight when the host was fasted, but rates of glucose utilization and glycogenesis were not increased. W.P.R.

(95f) Read found that *Calliobothrium verticillatum* and *Lacistorhynchus tenuis*, which produced no metabolic gas under anaerobic conditions, fermented glucose and galactose to acidic end-products. A number of other sugars and sugar-alcohols were not utilized. Fasting of the dogfish host for eight days led to a decrease in the size and number of *L. tenuis*; this was prevented by feeding starch or, to a lesser extent, glucose during the period of fasting. W.P.R.

(95g) Read & Rothman found that the change from starch to sucrose as the sole carbohydrate component in the diets of rats infected with *Hymenolepis diminuta* caused a decrease in the growth rate of the parasites. The quality and quantity of the carbohydrate affected growth rates both in initial and previously established infestations. Egg production was also affected; the substitution of dextrins-maltose, sucrose or fructose for starch in the hosts' diets greatly reduced egg production. In hosts which had access to diets with low carbohydrate and high roughage contents, *H. diminuta* attained the same size as in hosts given diets with high carbohydrate and low roughage contents. W.P.R.

(95h) La Rue reviews the history of the classification of digenetic trematodes and points out that as the taxonomic approach by Looss, Poche and others was based solely on adult morphology it failed to determine whether structural similarities indicated actual relationships or were merely the results of convergence. The studies of Sinitsin, of Cort, La Rue, Faust, Stunkard and others on development stages, particularly of the excretory systems, have provided material for a new approach to a natural system of classification. La Rue therefore sets out a system based solely on life-history data and provides a key to the Digenea based on the mode of development of the excretory bladder and on other larval characters. In a key, the families of the subclass Digenea are divided into two new superorder *Anepitheliocystidia* nom.nov. in which the primitive non-epithelial excretory bladder is retained with caudal excretory vessels in developing cercariae and *Epitheliocystidia* nom.nov. in which the primitive excretory bladder becomes thick-walled and epithelial and caudal excretory vessels are present or lacking in the cercarial tail which is reduced in size or

absent. *Anepitheliocystidia* comprises three orders (1) *Strigeatoidea* with suborders Strigeata (Strigeoidea, Clinostomatoidea, and Schistosomatoidea), Azygiata nom.nov. (Azygioidea, Transversotrematoidea nom.nov.), Cyclocoelata nom.nov. (Cyclocoeloidea) and Brachylaimata nom.nov. (Brachylaimoidea, Fellodistomatoidea nom.nov., and Bucephaloidea). (2) *Echinostomida* nom.nov. containing the suborders Echinostomata (Echinostomatoidea) and Paramphistomata (Paramphistomatoidea, Notocotyloidea nom.nov.) and (3) *Renicolida* nom.nov. with suborder Renicolata nom.nov. (Renicoloidea nom.nov.). The superorder *Epitheliocystidia* contains two orders, viz., (1) *Plagiorchiida* nom.nov. for the suborder Plagiorchiata nom.nov. (Plagiorchioidea, Allocreadioidea) and (2) *Opisthorchiida* nom.nov. for Opisthorchiata nom.nov. (Opisthorchioidea) and Hemiurata (Hemiuroidea). Many families are omitted owing to the lack of information on their life-histories but others are inserted on the basis of the comparative morphology of the adults. Their positions will have to be re-evaluated later when their life-histories are known. R.T.L.

96—Farmers' Bulletin. U.S. Department of Agriculture.

a. LUCKER, J. T. & FOSTER, A. O., 1957.—" Parasites and parasitic diseases of sheep." No. 1330, 50 pp. [Revised.]

97—Giornale di Malattie Infettive e Parassitarie.

a. VISCONTI, P., 1957.—" Un caso di cisticercosi cerebrale." **9** (2), 62–68.
b. PETRONE, P., 1957.—" L'anchilostomiasi in provincia di Potenza e sua infestazione a carattere endemico-epidemico nel Comune di Senise." **9** (2), 71–75.

(97b) Describing the factors favourable to the development of hookworm in the province of Potenza, Italy, Petrone notes its tremendous increase in the municipality of Senise in recent years. He recounts his results of laboratory, radiological and electrocardiograph tests on five severely affected hookworm patients. In hospital he has obtained excellent results by treating hookworm infections with two or three single doses, given a week apart, of 4 c.c. of pure chloroform in 30 gm. of castor oil. M.MCK.

98—Hassadeh.

a. MINZ, G., 1957.—[Experiment on control of root nematodes.] **37** (5), 415–416. [In Hebrew.]

(98a) In field-grown tomatoes root-knot indices were reduced and yields increased by the application of D-D mixture at 230 litres per hectare in furrows 30 cm. apart or 200 l. incorporated with vermiculite and spread in furrows, and by EDB at 20 l. in furrows or 30 l. with vermiculite. Nemagon injected by hand at 25 l. per ha. was also successful. Nemagon and EDB were diluted with naphtha. M.T.F.

99—Igaku Kenkyu. Kyushu University.

a. SHIGEMI, M., 1957.—[Studies on the lung-fluke *Paragonimus westermanii* (Kerbert, 1878). Part 1. Distribution of *P. westermanii* in the eastern part of Kyushu.] **27** (1), 153–158. [In Japanese: English summary p. 171.]
b. SHIGEMI, M., 1957.—[Studies on the lung-fluke *Paragonimus westermanii* (Kerbert, 1878). Part 2. Embolism caused by the egg of *P. westermanii* in its final host, particularly the differences between the egg-caused embolism due to this fluke and that due to *P. ohirai* Miyazaki, 1939.] **27** (1), 159–172. [In Japanese: English summary pp. 171–172.]

(99a) Metacercariae of *Paragonimus westermanii* were present in 34·5% of 2,524 specimens of the crab *Eriocheir japonicus* in the rivers of the eastern part of Kyushu, Japan. Male and female crabs were almost equally infected. The largest number of metacercariae found in a single crab was 357. R.T.L.

(99b) Ten cats were experimentally infected with *P. westermanii*. Eggs were found in the cerebrum in two and in the heart in two. None were present in the liver, kidney, adrenals, spleen or pancreas. In two cats and a weasel, infected with *P. ohirai*, there was a higher incidence of egg embolism than in those infected with *P. westermanii*. Two plates containing 10 photomicrographs illustrate the histopathology. R.T.L.

100—Indian Veterinary Journal.

a. ANANTARAMAN, M. & VICTOR, D. A., 1957.—" Cerebro-spinal nematodiasis. I: *Setaria* of bovines in India." **34** (3), 165–171.
b. MOHIYUDDEEN, S., 1957.—" Cerebrospinal nematodiasis among bovines." **34** (3), 171–172.
c. TYAGI, R. P. S., 1957.—" Two cases of dracontiasis in dogs." **34** (3), 214–215.
d. SHARMA, S. N., 1957.—" An unusual record of guineaworm from *Bufo melanosticus* in Assam." **34** (4), 289.

(100a) As a preliminary to a study of the aetiology of cerebrospinal nematodiasis specimens of *Setaria* were collected from *Bos indicus* and *B. bubalis* slaughtered in Madras. These were identified as *Setaria digitata*. None was found in ovines. Earlier observations are critically reviewed. R.T.L.

(100b) Enzootic bovine paraplegia is present in cattle in the Mysore State in acute, subacute and chronic forms. In acute cases, sudden and complete paralysis is followed by death in two to three days. In subacute and chronic cases, immobility of the tail and paraplegia followed by progressive paralysis of the anterior parts continues from a week to a month or even longer. Sheathed microfilariae 300 μ–850 μ in length were found in sediment from the spinal cord and brain after fixation in formalin. In two acute cases, immature nematodes other than microfilariae were present in the lumbar portion of the spinal cord. R.T.L.

(100c) Tyagi reports that two dogs infected with *Dracunculus medinensis* were seen at the Veterinary Hospital, Nainital. R.T.L.

(100d) Several adult and young female specimens of *Ichthyonema cylindraceum* were recovered from the body-cavity of *Bufo melanosticus* in Assam. The main bulk of the worm's body was occupied by a greatly distended uterus filled with undeveloped ova. R.T.L.

101—Irish Veterinary Journal.

a. CORCORAN, J. F., 1957.—" A method of control of 'hoose'." **11** (4), 85.

(101a) As adult resistant cattle ingest and destroy the third-stage larvae of *Dictyocaulus viviparus*, hoose can be controlled by pasture management. Owners are advised that infested pasture, which is to be used for rearing calves, should be grazed by cows only and to grass-harrow it, thoroughly and frequently, from October until the end of the year. R.T.L.

102—Journal of the American Medical Association.

a. WARNER, B. W., 1957.—" Diagnosis of schistosomiasis by sigmoidoscopy and rectal mucosal biopsy." **163** (15), 1322–1325.
b. BIRCH, C. L. & ANAST, B. P., 1957.—" The changing distribution of helminthic diseases in the United States." **164** (2), 121–126.

(102a) In view of the large shift of population to the United States from Puerto Rico, where *Schistosoma mansoni* is prevalent, attention is drawn to Ottolena & Atencio's method of making a rapid and precise diagnosis by biopsy of the rectal mucosa. R.T.L.

(102b) Immigrants from tropical countries and Americans returning from foreign towns are liable to introduce tropical diseases into the United States. Since 1950 many cases of *Schistosoma mansoni* and *Wuchereria bancrofti* have been reported. The possibility that these and other tropical parasites may become endemic in the United States is discussed. R.T.L.

103—Journal of the American Veterinary Medical Association.

a. JASKOSKI, B. J. & WILLIAMSON, W. M., 1957.—" Nematodiases in zoo animals—a preliminary report." **131** (4), 193–194.
b. DURRELL, W. B. & BOLTON, W. D., 1957.—" Parasitosis in a musk ox." **131** (4), 195–196.

(103a) The incidence of helminth infections as ascertained by flotation techniques of the faeces of 626 vertebrates, housed in the Chicago Zoological Park, is tabulated under Strongylidae, Ascaridae, Trichostrongylidae, Ancylostomidae, *Strongyloides* spp., *Trichuris* spp., *Enterobius* spp., *Gongylonema* sp., and *Physaloptera* sp. R.T.L.

(103b) The helminths collected from three musk oxen were identified as *Haemonchus contortus*, *H. placei*, *Moniezia expansa* and *Dictyocaulus viviparus*. No previous record of the occurrence of lungworms in the musk ox was traced. R.T.L.

104—Journal of the Australian Institute of Agricultural Science.

a. HUTTON, E. M. & BEALL, L. B., 1957.—" Root-knot nematode resistance in two pasture species of *Phaseolus*." **23** (2), 158.

(104a) When grown in pots of soil heavily infested with *Meloidogyne incognita*, *Phaseolus bracteatus* Nees & Mart. and *P. atropurpureus* D.C. grew normally and showed no root galling, while *P. lathyroides* was severely damaged. It is hoped that resistant species of *Phaseolus* may be used in root-knot infested pastures to replace *P. lathyroides*. M.T.F.

105—Journal of Comparative Pathology and Therapeutics.

a. ROSE, J. H. & MICHEL, J. F., 1957.—" Quantitative studies on the contamination of pasture herbage with husk worm larvae." **67** (1), 57–68.
b. ARCHER, R. K. & POYNTER, D., 1957.—" Anaemia and eosinophilia associated with helminthiasis in young horses." **67** (2), 196–207.

(105a) The spread of the infective larvae of *Dictyocaulus viviparus* in the field depends on various factors, viz., the consistency of the faeces, the tramping of grazing animals, the harrowing of the pasture, the influence of climatic factors, and to a slight extent on the break-up and scattering of faecal pats by birds. Data from experimental studies show that although the maximum number of larvae could be recovered from the herbage during the winter they were either non-infective or dead except for a few remaining in faecal pats. In spring and autumn all the living larvae recovered were infective but those collected from herbage during a hot and dry summer were dead except for some which survived for three weeks in faecal pats. Larvae in faecal pats are less exposed to adverse climatic factors and are spread by mechanical agencies. R.T.L.

(105b) The eosinophilia in the marrow and blood of four young ponies, kept at pasture to acquire natural helminth infections, closely followed the seasonal variations in the strongyle egg counts. Marked eosinophilia was not apparent during the migratory phase. Once the worm burdens had been established the eosinophilia was consistently higher in the test group than in six control ponies although the average counts of total circulating leucocytes were lower. Parasitic infections are the only natural cause, known to the authors, of eosinophilia of the marrow in horses. Normocytic normochromic anaemia was observed in the test group together with erythroid hypoplasia of the marrow. The anaemia reached a maximum in April but regressed sharply at the first flush of spring grass. Temporary, light infections of *Parascaris equorum* had no demonstrable effect on the peripheral blood or marrow. M.McK.

106—Journal of Experimental Biology.

a. HARRIS, J. E. & CROFTON, H. D., 1957.—" Structure and function in the nematodes: internal pressure and cuticular structure in *Ascaris*." **34** (1), 116–130.

(106a) The hydrostatic pressure in the pseudocoel of *Ascaris lumbricoides* has a mean value of 70 mm. Hg (95 cm. of water) but varies widely and often rhythmically from 16 mm. to 225 mm. Hg. The cuticular structure which is made up of a basketwork of inextensible

spiral fibrils at an angle of 75° to the longitudinal axis, allows for anisometric expansion and contraction under the action of the longitudinal muscles. R.T.L.

107—Journal of Experimental Medicine.

a. SHOPE, R. E., 1957.—" The leech as a potential virus reservoir." **105** (4), 373–382.

(107a) When leeches were fed consecutively on pigs with hog cholera and on rabbits with myxomatosis, both viruses persisted for 122 and 110 days respectively in the bloody contents of their intestines. But when leeches were fed first on rabbits with myxomatosis and later on pigs with hog cholera only the myxoma virus could be demonstrated. On three occasions hog cholera was apparently transmitted by infected leeches. As no virus could be recovered from the tissues it is concluded that the leech carried the viruses mechanically but is a potential reservoir. R.T.L.

108—Journal of Infectious Diseases.

a. KAGAN, I. G. & MERANZE, D. R., 1957.—" The histopathology of the liver in mice experimentally infected with *Schistosomatium douthitti*." **100** (1), 32–39.
b. VOGEL, H., WIDELOCK, D. & FUERST, H. T., 1957.—" A microflocculation test for trichinosis." **100** (1), 40–47.
c. RENDTORFF, R. C. & WILCOX, A., 1957.—"The role of nematodes as an entry for viruses of Shope's fibromas and papillomas of rabbits." **100** (2), 119–123.

(108a) Kagan & Meranze infected mice with cercariae of *Schistosomatium douthitti* producing male, female and bisexual infections. The mice were killed at approximately monthly intervals and the livers examined. Female and bisexual infections caused essentially similar lesions which were associated with eggs and the formation of granulomata. Male infections produced inflammatory reactions, mainly with mononuclear cells, around large veins and in some animals there were intense accumulations of pigment. Mice which received a challenging infection 60 days after the initial exposure showed no enhanced cellular response to it. Mice which were cured of the infection by 12 intraperitoneal injections of 4 mg. of tri-(n-dodecyl-mercapto)-s-antimonious acid in peanut oil showed a return to normal histology of the liver in about 270 days. S.W.

(108b) Vogel *et al.* describe in detail the preparation of an antigen from lyophilized Trichinella larvae, its suspension in a cholesterol and lecithin mixture and the use of this suspension in microflocculation tests. They tested 304 specimens from 177 clinical cases of trichinelliasis by means of complement fixation, Bozicevich's antigen and the new antigen (C-L test) and found that the C-L test was not as sensitive as the other two, the number of positive results obtained being respectively 195, 189 and 182. When tested for cross reactions with sera of patients with various other infections the C-L test appeared to be more specific and in all sera negative results were more homogeneous than with the two other tests. The C-L test failed to detect antibodies in two of 18 patients in whom larvae had been demonstrated by muscle biopsy but in both these only a single specimen of serum was examined. Serological examinations should be repeated at intervals for as long as nine weeks after the onset of symptoms. S.W.

(108c) No tumours developed when rabbit papilloma virus or *Nippostrongylus muris* larvae were applied to the skin of rabbits, but when a suspension of the virus containing the larvae was applied papillomatous tumours resulted. The results were negative when a suspension of rabbit fibroma virus containing the larvae was used. R.T.L.

109—Journal of the International College of Surgeons.

a. TAIANA, J. A., 1957.—" Surgical treatment of hydatid cysts of the lung in two hundred cases." **27** (1), 92–100. [French, German, Italian, Spanish & Portuguese summaries p. 99.]

110—Journal of the Maine Medical Association.

a. GREGORY, P. O., 1957.—" *Oxyuris vermicularis*." **48** (1), 5–6.

111—Journal of the National Medical Association. New York.

a. BRISCOE, M. S., 1957.—" The severity of trichuriasis among children in Costa Rica." **49** (2), 96–98.

(111a) Trichuriasis in children is a major problem in Costa Rica. Heavy infections evoke diarrhoea with blood-stained stools, recurring abdominal pains, anaemia, cachexia and rectal prolapse. The results of treating five children with hexylresorcinol enemata are tabulated and show very considerable reduction in the egg counts per gm. of faeces. R.T.L.

112—Journal of Parasitology.

a. DEWITT, W. B., 1957.—" Experimental schistosomiasis mansoni in mice maintained on nutritionally deficient diets. I. Effects of a *Torula* yeast ration deficient in Factor 3, vitamin E, and cystine." **43** (2), 119–128.

b. DEWITT, W. B., 1957.—" Experimental schistosomiasis mansoni in mice maintained on nutritionally deficient diets. II. Survival and development of *Schistosoma mansoni* in mice maintained on a *Torula* yeast diet deficient in Factor 3, vitamin E, and cystine." **43** (2), 129–135.

c. MICHELSON, E. H. & AUGUSTINE, D. L., 1957.—" Studies on the biological control of schistosome-bearing snails V. The control of *Biomphalaria pfeifferi* populations by the snail, *Marisa cornuarietis*, under laboratory conditions." **43** (2), 135.

d. PETERS, L. E., 1957.—" An analysis of the trematode genus *Allocreadium* Looss with the description of *Allocreadium neotenicum* sp.nov. from water beetles." **43** (2), 136–142.

e. MANKAU, S. K., 1957.—" Studies on *Echinococcus alveolaris* (Klemm, 1883), from St. Lawrence Island, Alaska. I. Histogenesis of the alveolar cyst in white mice." **43** (2), 153–159.

(112a) In mice maintained on a dried *Torula* yeast ration *Schistosoma mansoni* did not attain their normal size and seldom reached sexual maturity, but when a Factor 3 concentrate from Brewer's yeast or a combination of vitamin E and cystine was added the results were similar to those in mice on a full diet. R.T.L.

(112b) The number of *Schistosoma mansoni* recovered from mice, maintained on a deficient "*Torula* yeast" diet, eight weeks after uniform exposure to 150 cercariae averaged $38{\cdot}3 \pm 1{\cdot}9$ worms as compared with an average of $22{\cdot}7 \pm 1{\cdot}1$ worms recovered from those kept on a control diet containing optimal ingredients. Moreover, only a few worms attained sexual maturity, the ovaries were much smaller and the eggs were darkly pigmented and highly granular. The males and females were severely stunted. The natural resistance of the mice was evidently lowered by the deficient diet. R.T.L.

(112c) Although the snail *Marisa cornuarietis* does not destroy its own egg masses or young, *Biomphalaria pfeifferi* failed to increase in an aquarium population as their egg masses and young were devoured if adult *Marisa* were also present. R.T.L.

(112d) A key is given to the North American species of *Allocreadium* including *A. neotenicum* n.sp. from the haemocoel of the dytiscid beetles *Acilius semisulcatus*, *Dytiscus* sp. and *Agabus* sp. from forest pools and bogs near Douglas Lake, Michigan. *A. neotenicum* resembles *A. lobatum* but the testes are smooth or somewhat irregular but not lobed. The ventral sucker is larger than the oral sucker and large cells protrude into the lumen of the excretory bladder which slightly overlaps the anterior testis. The genus *Allocreadium* is analysed and emended. *Allocreadium wallini* and *A. chuscoi* are transferred to *Crassicutis* and *A. oncorhynchi* and *A. boleosomi* to *Plagioporus*, as n.combs. *P. lepomis* is a synonym of *P. boleosomi*. Six species definitely do not belong to *Allocreadium* but cannot yet be placed elsewhere. R.T.L.

(112e) The development of the alveolar cyst of *Echinococcus alveolaris* in white mice infected with eggs from a naturally infected arctic fox was much more rapid than that of *E. granulosus* in pigs. It is malignant in growth and invades the host tissue by exogenous and endogenous budding until the host dies. The size of the cyst is not a measurement of its stage of development. Scolex production was seen only four months after infection. Large cysts sometimes contained scolices in early stages of development while cysts only 155 μ in diameter had three or four scolices with well developed hooklets and calcareous bodies. R.T.L.

112—Journal of Parasitology (cont.)

f. LELAND, Jr., S. E. & DRUDGE, J. H., 1957.—" Studies on *Trichostrongylus axei* (Cobbold, 1879). II. Some quantitative aspects of experimental infections in rabbits." **43** (2), 160–166.
g. NEZ, M. M. & SHORT, R. B., 1957.—" Gametogenesis in *Schistosomatium douthitti* (Cort) (Schistosomatidae: Trematoda)." **43** (2), 167–182.
h. JONES, Jr., J. K., 1957.—" Type hosts of the bat trematodes, *Prosthodendrium oligolecithum* Manter and Debus, 1945, and *Acanthatrium macyi* Sogandares-Bernal, 1956." **43** (2), 185.
i. HANSON, H. C., LEVINE, N. D., KOSSACK, C. W., KANTOR, S. & STANNARD, L. J., 1957.—" Parasites of the mourning dove (*Zenaidura macroura carolinensis*) in Illinois." **43** (2), 186–193.
j. ALICATA, J. E., 1957.—" Observations on the ineffectiveness of 'Polybor-3' in destroying the vitality of the eggs of *Ascaris suum* in soil." **43** (2), 193.
k. UZMANN, J. R. & HESSELHOLT, M. N., 1957.—" New host and locality record for *Triaenophorus crassus* Forel (Cestoda: Pseudophyllidea)." **43** (2), 205.
l. NAGATY, H. F., 1957.—" Trematodes of fishes from the Red Sea. Part 8. Five species in the families Schistorchidae, Acanthocolpidae and Heterophyidae." **43** (2), 217–220.

(112f) For rabbits, six to 12 weeks old, the lethal dose of *Trichostrongylus axei* larvae was ascertained to be 13,000 larvae. The most efficient larval dose was 4,000 of which 31% were later recovered as worms at autopsy. The interval between infection and death in ten rabbits ranged from 31 to 72 days. The prepatent period averaged 22·7 days for 17 animals. Over 90% of the worms were recovered from the gastric mucosa. There was some migration or mechanical translocation to the stomach contents after death. A second infection with larvae slightly increased the number of worms established. The egg-laying capacity of the worms was adversely influenced by the approach of death of the host in those succumbing to the infection. The gastric mucosa showed inflamed, haemorrhagic, ulcerated and necrotic areas. R.T.L.

(112g) The general pattern of spermatogenesis and oogenesis in *Schistosomatium douthitti* follows that of other trematodes but maturation and fertilization are completed only after the eggs are deposited in the tissues. A primary spermatogonium gives rise to eight primary spermatocytes by three mitotic divisions and two maturation divisions produce a cluster of 32 spermatids. The mature spermatozoon has a thin elongate body with two flagella. R.T.L.

(112h) The type host of *Prosthodendrium oligolecithum* originally reported as *Myotis californicus* proves on re-examination to be *Pipistrellus s. subflavus* and that of *Acanthatrium macyi*, reported as *Pipistrellus* sp., is more precisely *P. savii coreensis*. R.T.L.

(112i) The only helminth parasites found in the mourning dove in Illinois during a seven-year survey (devoted principally to protozoal parasites) were unsheathed microfilariae, 46–62 $\mu \times 3$–4 μ, and, so far unidentified, adult tapeworms present in the body-cavity of two out of over 1,000 doves. R.T.L.

(112k) *Triaenophorus crassus* constitutes a serious economic problem in the prairie provinces of Canada and occurs in approximately 10% of the catches of the chum salmon *Oncorhynchus keta*, near Kotzebue, Alaska. Its occurrence in this locality lends support to the view that *T. crassus* entered North America via the late Siberian-Alaskan land bridge as a parasite of the pike *Esox lucius*. R.T.L.

(112l) The following five species were collected at Ghardaga on the Red Sea; *Schistorchis haridis* n.sp. from *Pseudoscarus harid*, differs from *S. callyodontis* in having the acetabulum slightly larger than the oral sucker, the seminal vesicle dorsal to the acetabulum and a larger pharynx. The ovary is much nearer the acetabulum and the genital pore is placed to the left rather than median. *Stephanostomum platacis* n.sp. from *Platax* sp. is very similar to *S. bicoronatum* but the body and eggs are much smaller. It has 40 rather than 30–33 oral spines. It differs also from *S. ditrematis* in that the vitellaria extend anterior to the base of the cirrus sac and the ovary lies close to the anterior testis. *Stephanostomum naucrotis* n.sp. resembles *S. ditrematis* but is much smaller. The prepharynx is shorter, the eggs smaller and

112—Journal of Parasitology (cont.)

m. CORT, W. W., HUSSEY, K. L. & AMEEL, D. J., 1957.—" Variations in infections of *Diplostomum flexicaudum* (Cort and Brooks, 1928) in snail intermediate hosts of different sizes." **43** (2), 221–232.
n. BABERO, B. B., 1957.—" Some helminths from Illinois opossums." **43** (2), 232.
o. SCHILLER, E. L., 1957.—" Studies on the helminth fauna of Alaska. XXXII. *Hymenolepis echinorostrae* n.sp., a cestode from the lesser scaup, *Aythya affinis* (Eyton)." **43** (2), 233–235.
p. SADUN, E. H. & NORMAN, L., 1957.—" Metabolic and somatic antigens in the determination of the response of rabbits to graded infections with *Trichinella spiralis*." **43** (2), 236–245.
q. WOOTTON, D. M., 1957.—" The life history of *Cryptocotyle concavum* (Creplin, 1825) Fischoeder, 1903 (Trematoda: Heterophyidae)." **43** (3), 271–279.
r. DAYTON, D. A., 1957.—" The earthworm, *Eisenia lonnbergi*, a new intermediate host for swine lungworms." **43** (3), 282.

there are 32 rather than 36–40 oral spines. Specimens identified as *Stephanostomum casum* (Linton, 1910) were obtained from *Lethrinus mehsenoides*, *L. nebulosus*, *Sargus noct* and *Balistes aculeatus* and had a longer oesophagus than in the type material. *Metadena leilae* n.sp. from *Lethrinus rostratus* is nearest to *M. crassulata* but the body is more elongate, the testes more posterior, the vitelline fields more separate and the ovarian lobes are fewer. R.T.L.

(112m) Although *Fossaria abrussa*, *Stagnicola emarginata*, *S. palustris* and *Limnaea stagnalis* (intermediate hosts of *Diplostomum flexicaudum*) vary greatly in size, the infections found in the smallest snails were no more injurious than in the largest. Greater numbers of daughter sporocysts, and of larger size, develop in the larger snails. It appears that the mother sporocysts in the smallest snails are prevented from producing more daughter sporocysts than can develop normally and produce cercariae. R.T.L.

(112n) Babero lists ten species of helminths recovered from two opossums. On the serous surface of the jejunum and ileum there were elevated nodules, due to *Hamanniella tortuosa*, which had penetrated the gut wall, causing almost complete destruction of the mucous and submucous layers, some focal atrophy and necrosis of the muscular layer and some deposition of pigment. R.T.L.

(112o) *Hymenolepis echinorostrae* n.sp. from the lesser scaup duck, *Aythya affinis*, on Amchitka Island, Alaska, has a circlet of 20 spines on the apex of the rostellum (which is covered with spines) which distinguishes it from all known species of *Hymenolepis*. R.T.L.

(112p) Although flocculation tests with metabolic and somatic antigens gave consistent results in rabbits infected with *Trichinella spiralis*, the metabolic antigen appeared to give the test a greater sensitivity than the somatic antigen. But with somatic antigen, sera from rabbits with the muscular phase of infection only produced higher titres when the larvae were presumably dead or degenerating although higher titres occurred with the metabolic antigen when the larvae were still alive. In infections with 300,000 larvae, or more, death occurred primarily during the intestinal phase and in lighter infections (200,000 or less) during the muscular phase. The size of the inoculum was directly related to the percentage mortality in each group and inversely to the average time between the inoculation and death. R.T.L.

(112q) On the Santa Ynez River in California *Gasterosteus aculeatus* are often entirely black from melanin deposited in encysted metacercariae. When fed to young chicks and ducklings the metacercariae developed in 24 to 48 hours into adult *Cryptocotyle concavum*. The local natural definitive host has not yet been determined. The first intermediate host was the predominant local snail, *Amnicola longinqua*, of which 60% were infected. The pleurocercous cercaria were used to infect local sticklebacks. The miracidia, rediae, cercariae, metacercariae and adults are described and figured but no sporocysts were found, although hundreds of snails were examined throughout the year. R.T.L.

(112r) *Eisenia lonnbergi* were found to contain infective lungworm larvae three weeks after exposure to a mixture of embryonated eggs of *Metastrongylus elongatus* and *Choerostrongylus pudendotectus*. R.T.L.

112—Journal of Parasitology (cont.)

s. SCOTT, D. M., 1957.—" Records of larval *Contracaecum* sp. in 3 species of mysids from the Bras d'Or Lakes, Nova Scotia, Canada." **43** (3), 290.
t. GOODCHILD, C. G., 1957.—" *Trichinella spiralis* infections in Thiry-Vella fistulated rats." **43** (3), 294–303.
u. PELLEGRINO, J., POMPEU MEMÓRIA, J. M. & MACEDO, D. G., 1957.—" Quantitative aspects of the intradermal test with cercarial antigen in schistosomiasis." **43** (3), 304–307.
v. McGEE, G., RUSSOMANNO, R. & SANDGROUND, J. H., 1957.—" An expeditious method for counting trichostrongylids and other helminths of the small intestine." **43** (3), 315–317.
w. HUTCHISON, W. M., 1957.—" The incidence and distribution of *Hydatigera taeniaeformis* and other intestinal helminths in Scottish cats." **43** (3), 318–321.
x. MEYERS, H. F., 1957.—" Physical observations on *Echinococcus* eggs, Part II: A simple method for the determination of viability." **43** (3), 322–323.

(112s) Scott has found *Contracaecum* larvae in the crustaceans, *Erythrops erythropthalma*, *Mysis mixta* and *Neomysis americana*, from the salt water Bras d'Or Lakes in Nova Scotia. Apparently this is the first record of the occurrence of *Contracaecum* larvae in the Mysidacea which form an important constituent of the diet of many marine fishes. R.T.L.

(112t) Artificially excysted trichina larvae were implanted in Thiry-Vella fistulas in Wistar rats and the subsequent course of infection was followed. The parasites reached maturity and reproduced, but the sexually mature worms were stunted and hardly exceeded the larvae in length. Encysted larvae were subsequently found in the skeletal musculature but were fewer than in the controls. When fed to rats they gave rise to normal infections of the muscles. R.T.L.

(112u) The intradermal test, with cercarial antigen, was made on 250 patients with *Schistosoma mansoni* eggs in their faeces. Fifteen minutes later the areas of the wheals which followed the injections of 0·05 ml. of the antigen in five different concentrations was ascertained by a planimeter. Analysis of the results showed that the mean areas of the wheals increased in all age groups with the concentration of antigen used. The response was greatest in the oldest and least in the youngest age group. R.T.L.

(112v) A procedure for counting helminths present in the small intestine (which the authors confess is more rapidly accomplished and more simple to perform than to describe) consists in excising about 15 to 20 cm. of the small intestine and everting it along the length of an ordinary applicator stick so that the mucous membrane becomes exposed with the parasites still adherent. The preparation is then put into a Petri dish, covered with saline or 1% HCl and placed in an incubator at 45°C. for five to ten minutes. The irritating effect of the heat and acidified medium causes the worm to leave the mucosa when they can easily be counted. R.T.L.

(112w) Examination of over 1,000 stray cats, which had been killed by the City [presumably of Glasgow] Authorities, gave an incidence of *Hydatigera taeniaeformis* in 7·7%, *Dipylidium caninum* in 50·5%, *Toxocara mystax* in 13·7% and *Toxascaris leonina* in 15·3%. An unidentified *Diphyllobothrium* species was found on two occasions. The effect of increased worm burden on the distribution of *H. taeniaeformis* in the anterior, middle and posterior thirds of the small intestine of 132 naturally infected cats is indicated by a table. R.T.L.

(112x) The viability of *Echinococcus* eggs can be ascertained by a fast and relatively simple method. It requires two solutions, viz., one made by adding 0·1 gm. of 1:3000 pepsin, 2·4 gm. NaCl and 0·057 gm. Na_3PO_4 $12H_2O$ to 300 ml. of $6{\cdot}7 \times 10^{-3}$M of HCl and the other by adding 1·2 gm. of 1:250 of trypsin and 2·4 gm. of NaCl to 300 ml. of $6{\cdot}775 \times 10^{-2}$M of Na_2HPO_4. After five ml. of each solution have been heated to 35°–40°C. one ml. of fluid containing eggs and gravid segments are put into the tube containing No. 1. solution and incubated for three to five minutes. The No. 2 solution in the other tube is now added. The eggs and free oncospheres settle in about 30 seconds. Approximately one ml. of the sediment is pipetted off and examined microscopically for moving oncospheres. R.T.L.

112—Journal of Parasitology (cont.)

y. WILLEY, C. H. & GROSS, P. R., 1957.—" Pigmentation in the foot of *Littorina littorea* as a means of recognition of infection with trematode larvae." **43** (3), 324–327.
z. ALEXANDER, C. G. & ALEXANDER, E. P., 1957.—" *Oochoristica crotalicola*, a new anoplocephalid cestode from California rattlesnakes." **43** (3), 365–366.
ba. SINGH, K. S., 1957.—" *Diplostomulum elongatus* n.sp. (Trematoda), from a freshwater fish, *Trichogaster fasciatus*, from India." **43** (3), 371–373.
bb. BYRD, E. E., 1957.—" *Bilharziella littlebi* (Byrd, 1956), a blood fluke (Digenea: Schistosomatidae: Bilharziellinae) from the chestnut-sided warbler, *Dendroica pennsylvanica* (Linnaeus)." **43** (3), 374–376.
bc. SINGH, K. S., 1957.—" *Oochoristica tandani* n.sp. (Cestoda), from a snake, *Lycodon aulicus*, from India." **43** (3), 377–379.
bd. KURTPINAR, H., 1957.—" Helminths in quail (*Coturnix coturnix*) in Turkey." **43** (3), 379.
be. LEVIN, N. L., 1957.—" The occurrence of *Panopistus pricei* in Illinois." **43** (3), 379.
bf. SINDERMANN, C., ROSENFIELD, A. & STROM, L., 1957.—" The ecology of marine dermatitis-producing schistosomes. II. Effects of certain environmental factors on emergence of cercariae of *Austrobilharzia variglandis*." **43** (3), 382.
bg. SADUN, E. H. & ALLAIN, D. S., 1957.—" A rapid slide hemagglutination test for the detection of antibodies to *Trichinella spiralis*." **43** (3), 383.

(112y) When *Littorina littorea* is infected with trematode larvae the colour of the expanded foot changes from white or grey to orange or brown, owing to the release into the circulation of a yellow-orange pigment from the damaged digestive organ. R.T.L.

(112z) *Oochoristica crotalicola* n.sp., from the Californian rattlesnakes *Crotalus viridis helleri* and *C. cerastes laterorepens*, most closely resembles *O. osheroffi* but the latter has a considerably wider scolex, a larger ovary, the testes are more compactly grouped and the female organs located more centrally. R.T.L.

(112ba) In *Diplostomulum elongatus* n.sp. from a fresh-water fish *Trichogaster fasciatus* collected at Lucknow, the presence of a well developed hold-fast gland and the position of the acetabulum, which is anterior to the middle of the body, distinguish it from all other species of the genus. R.T.L.

(112bb) The presence of a well defined cirrus pouch in a male of *Pseudobilharziella littlebi* Byrd, 1956, collected from a warbler, *Dendroica pennsylvanica*, at Mountain Lake, Giles County, Virginia, necessitates the transfer of the species to the genus *Bilharziella*. Although the warbler was naturally infected Byrd thinks it unlikely that it is the normal host. R.T.L

(112bc) *Oochoristica tandani* n.sp. from a snake *Lycodon aulicus*, killed at Lucknow, is described and is differentiated from *O. elaphis* and *O. ameivae* on the size of the strobila, scolex, cirrus pouch and oncospheres and from *O. fibrata* on the greater number of testes (37 to 45) and the irregular alternation of the genital pores. R.T.L

(112bd) The helminths found in 26 quails, *Coturnix coturnix*, mostly from the Turkish Province of Samsun near the Black Sea, were (in order of prevalence) *Heterakis gallinae*, *Raillietina echinobothrida*, *Choanotaenia infundibulum*, *Subulura differens* and *Tetrameres fissispina*. R.T.L

(112be) Levin recovered *Panopistus pricei* from ten out of 13 short-tailed shrews, *Blarina brevicauda*, trapped in Trelease Woods, Illinois. R.T.L.

(112bf) The emergence of cercariae of *Austrobilharzia variglandis* from the marine snail *Nassarius obsoletus* was studied under varying environmental conditions of temperature, salinity and molluscan nutrition. Both the percentage of infected snails emitting cercariae and the number of cercariae emitted were greatest in salinities of between 15 and 25 parts per thousand. In starved snails there was a three to four day interval between the peaks of cercarial emergence while massive emergence followed within 48 hours of feeding. R.T.L.

(112bg) Preliminary experiments have indicated that antibodies in the sera of trichinosis patients can be measured by adsorbing the antigen on to tanned erythrocytes in a rapid slide haemagglutination test. Very minute amounts of antigens and antisera are required but the sensitivity and specificity of the test have not yet been determined. R.T.L.

113—Journal of Pathology and Bacteriology.

a. JARRETT, W. F. H., McINTYRE, W. I. M. & URQUHART, G. M., 1957.—" The pathology of experimental bovine parasitic bronchitis." **73** (1), 183–193.

(113a) Jarrett *et al.* describe and illustrate with photomicrographs the pathological changes in the lungs and mesenteric lymph glands of two-months-old calves, up to 90 days after a single infection of 5,000, 50,000 or 240,000 larvae of *Dictyocaulus viviparus*. Pulmonary lesions were observable after seven days, i.e. two weeks before larvae appeared in the faeces, and persisted after the parasites had been cast off. It is pointed out that in animals dying on or before the 18th day the worms may be overlooked unless the bronchial mucus is examined microscopically and this may explain some cases of fog fever. The authors conclude that the signs interpreted as pneumonia in field cases of "peracute pneumonia" are (i) prepatent parasitic bronchitis giving rise to dyspnoea and (ii) pulmonary oedema producing audible râles. McIntyre (in press) has noted that, in cattle, râles are nearly always caused by pulmonary oedema and not inflammatory exudate in the bronchi. Many deaths from parasitic bronchitis are caused by a vicious circle which can be summarized thus: primary pulmonary lesions causing dyspnoea and inspiratory distress giving rise successively to interstitial emphysema and expiratory distress, cardiac anoxia, pulmonary oedema, hyaline membrane formation and more dyspnoea and inspiratory distress. M.McK.

114—Journal of Tropical Medicine and Hygiene.

a. CRIDLAND, C. C., 1957.—" Further experimental infection of several species of East African freshwater snails with *Schistosoma mansoni* and *S. haematobium*." **60** (1), 18–23.

b. WATSON, J. M., 1957 —" Aspects of the investigation and control of schistosome vector snails." **60** (6), 129–131.

(114a) To the five species of *Biomphalaria* previously incriminated by Cridland [for abstract see Helm. Abs., **24**, No. 31a] as vectors of *Schistosoma mansoni* in East Africa four additional species are now added as a result of experiments on laboratory-reared specimens, viz., *B. adowensis nairobiensis*, *B. pfeifferi*, *B. stanleyi*, *B. smithi* and *B. elegans*. *B. adowensis nairobiensis* is common in Kenya and Northern Tanganyika but not in Uganda. *B. pfeifferi* is common in the Lake Province of Tanganyika but was not found by the author in Uganda. *B. stanleyi* has so far only been recorded from Lake Albert. *B. smithi* is common in Lake Edward and in the upper part only of Semliki River. The first three species were highly susceptible and were also found naturally infected. They must be considered important vectors, but *B. elegans* although experimentally infected was proved considerably less susceptible (7% to 15%). Only negative results were obtained from attempts to infect *Bulinus tropicus tropicus*, *B. t. mutandaensis*, *B. t. alluaudi* and *B. coulboisi* with *Schistosoma haematobium*. Cridland concludes that all the ten species and subspecies of *Biomphalaria* known in East Africa are vectors of *S. mansoni* and that the only *Bulinus* species known to be responsible for the transmission of *S. haematobium* in Uganda are *B.* (*Physopsis*) *nasutus* and *B.* (*P.*) *globosus globosus*. No evidence was obtained that there were local strains of *S. haematobium* or *S. mansoni*. R.T.L.

(114b) Watson reviews the problems involved in the study of schistosome intermediaries and means of controlling them. The collection and interpretation of oecological data are fundamental and when more knowledge is acquired, the oecological information must then be applied to control. The methods and frequency of dispersal of the snails and the reasons for limitation of distribution, both local and general, require investigation and much remains to be discovered of the habitats, habits and behaviour, life-cycles, and relationships to man and to larval schistosomes. S.W.

115—Khirurgiya. Moscow.

a. LVOV, A. N., 1957.—[Pulmonary echinococcosis.] **33** (1), 75–81. [In Russian.]
b. SHISHKIN, I. Z., 1957.—[Liver resections for *Echinococcus alveolaris*.] **33** (2), 115–116. [In Russian.]
c. IVANOV, P. A., 1957.—[Rupture of a hydatid cyst of the liver into the gall-bladder.] **33** (2), 116–117. [In Russian.]

116—Maroc Médical.

a. DELON, J. & GEFFROY, A., 1957.—" Les kystes hydatiques de l'enfant au Maroc." **36** (383), 329–339.

117—Medical Times. New York.

a. McNIEL, J. R., 1957.—" Schistosomiasis. Infestation by the parasites of the family Schistosomatidae, or their larval forms." **85** (2), 159–170.

(117a) For general practitioners, McNiel succinctly summarizes published work on the schistosomes and schistosomiasis, dealing briefly with the classification of the parasites and their life-cycle, the pathology, clinical picture, diagnosis and treatment of schistosomal infections, the molluscan vectors and their control. The various species of Schistosomatidae liable to cause dermatitis are listed under geographical regions: 14 species and two varieties for Africa and the Near East, nine species for India, 24 for America and seven for the Orient. R.T.L.

118—Meditsinskaya Parazitologiya i Parazitarnie Bolezni. Moscow.

a. PODYAPOLSKAYA, V. P., 1957.—[The scientific problems of prevention and treatment of cestode diseases. (Taeniarhynchiasis, taeniasis, echinococcosis).] **26** (2), 131–136. [In Russian: English summary p. 136.]
b. ABASOV, K. D., 1957.—[Effect of the way of keeping of cattle on the spreading of taeniarhynchiasis.] **26** (2), 137–140. [In Russian: English summary p. 140.]
c. LEIKINA, E. S., 1957.—[Concerning the natural foci of infection of certain helminthiases.] **26** (2), 140–152. [In Russian: English summary p. 152.]
d. OZERETSKOVSKAYA, N. N. & USPENSKI, S. M., 1957.—[Group infection by trichinelliasis from the meat of white bear in the Soviet Arctic region.] **26** (2), 152–159. [In Russian: English summary pp. 158–159.]
e. KOIFMAN, S. I., 1957.—[A case of group infestation by Trichinella.] **26** (2), 159–160. [In Russian.]
f. BRUSILOVSKI, I. Z., 1957.—[Group infestation by Trichinella in the extreme north.] [Abstract.] **26** (2), 161. [In Russian.]
g. GELLER, E. R., 1957.—[Trichinelliasis of wolves in the Kursk region.] **26** (2), 161–163. [In Russian: English summary p. 163.]
h. GELLER, I. Y., 1957.—[Concerning the spread of echinococcosis in Nikolayev region.] **26** (2), 163–166. [In Russian.]
i. MAO, S. P. & LU, K. L., 1957.—[Studies on the cultivation of *Schistosoma japonicum* in vitro.] **26** (2), 166–172. [In Russian: English summary pp. 171–172.]
j. CHEBOTAREV, R. S., 1957.—[Schistosomal dermatitis in man.] **26** (2), 172–175. [In Russian: English summary p. 175.]
k. MIKHAILYUKOV, N. D., 1957.—[A case of pneumonia in a cat due to migration of nematode larvae.] **26** (2), 176–177. [In Russian.]
l. GERBILSKI, V. L. & SICH, G. Y., 1957.—[The ways of penetration of ascarid larvae into the systemic circulation.] **26** (2), 177–181. [In Russian.]
m. GRUZINSKAYA, A. P. & PANFEROVA, E. A., 1957.—[Experimental treatment of trichocephaliasis with oxygen.] **26** (2), 182–184. [In Russian: English summary p. 184.]
n. KROTOV, A. I., 1957.—[On the mechanism of the action of santonin on Ascaris.] **26** (2), 185–193. [In Russian: English summary p. 193.]
o. SERGEEV, D. V., 1957.—[On the technique of placing the test ova of helminths into the ground.] **26** (2), 194–195. [In Russian.]
p. GUDZHABIDZE, G. S., 1957.—[Methods of examination of airborne dust for the presence of helminth ova.] **26** (2), 195–196. [In Russian: English summary p. 196.]

(118b) In Azerbaijan the high incidence of taeniasis (0·8–45·2%) is chiefly due to the local habit of eating slices of meat roasted on spits. The main sources of infection for cattle are herdsmen and milkmaids; and cattle resting places on pastures near to habitations are of great epidemiological importance. G.I.P.

(118c) Leikina distinguishes three types of natural foci of trichinelliasis of man: (i) permanent foci where infection occurs through domestic animals, (ii) permanent foci with infection through wild animals and (iii) temporary foci where the sources of human infection are domestic animals which have become infected from wild animals. G.I.P.

(118d) Trichinella infection was acquired through eating the meat of a polar bear by three out of six members of a Polar expedition to Bennett Island. The infection resulted in high fever, muscular pains, facial oedema, skin eruptions and eosinophilia of up to 24–88%. G.I.P.

(118e) The clinical history is given for five cases of trichinelliasis, all of which became infected through eating salted pig fat which came from Transcarpathia. G.I.P.

(118f) Eighteen out of 44 youths became infected with Trichinella through eating boiled, fried and insufficiently corned bear meat. G.I.P.

(118g) Almost all wolves in the Kursk region were infected with Trichinella indicating a local focus of the infection and providing a possible source of infection to the population through domestic animals. To prevent an outbreak of such an infection, intensified extermination of wolves, strict adherence to the hygienic regulations on pork in meat plants and careful disposal of the carcasses of infected wild and domestic animals are advocated. G.I.P.

(118h) The occurrence of echinococcosis in cattle is given for the various areas of the Nikolayev region (Ukraine). The average infection observed for six years prior to 1954 in the Nikolayev slaughterhouse was 8·38% of large cattle and 4·18% of small cattle. The distribution of the infection in cattle was reflected among the population, where 40 cases have been observed. G.I.P.

(118i) Adult schistosomes prefer serum media mixed with Tyrode's solution to plain serum and to media containing blood cells or haemoglobin, mule serum to horse, cattle, sheep or donkey sera and media with glucose to those without. In mule serum and Tyrode's solution at 1:2 proportion the worms survived for 16·65 days. An addition of 50 units of penicillin and streptomycin to each ml. of culture keeps it sterile even if aseptic precautions are not strictly observed, and even 1,000 units per ml. were not harmful to the worms. A frequent change of culture medium reduced degeneration of the worms to a minimum, especially when a serum-Tyrode-glucose solution with added liver extract was used. In artificial media of glucosed Tyrode's solution and vitamin B complex or ascorbic acid the maximum length of survival was 5·95 days. Slight development of immature schistosomes was observed under culture conditions. G.I.P.

(118j) The fresh-water molluscs in a pond near a bird farm in the Dnieper flood-plain near Kiev were infected with *Echinostoma revolutum*, *Notocotylus attenuatus*, *Hypoderaeum conoideum* and some undiagnosed furcocercariae. The snail collector was attacked on the legs, which had been submerged in the pond water, by schistosomatid cercariae and the course of the subsequent dermatitis is described. A similar dermatitis was sometimes observed among the local population. G.I.P.

(118l) Gerbilski & Sich showed in dogs that the *Toxocara canis* larvae which did not remain in the lungs but were found 4 to 5 weeks after experimental infection in the myocardium, spleen and kidney, had re-entered the systemic circulation by passing from the pulmonary artery into the pulmonary vein through anastomoses. These anastomoses were 150–250 μ in diameter as compared with the diameter of newly hatched larvae which was only 20 μ to 22 μ. G.I.P.

(118m) No eggs were found in 72·4% of the patients with *Trichuris trichiura* treated by rectal intubation of oxygen in doses of five litres for five successive days. The treatment was without harmful side effects. G.I.P.

(118n) Although santonin shows an effect on Ascaris even in dilutions of 10^{-15}, a saturated oil solution does not kill the worms. Santonin acts through the sensory extremities and the central nervous system of the worms. Its effect is first observed 15 to 60 minutes after the worms have been placed in solution and lasts for one to two days. In adult worms a primary violent excitation is followed by depression, in immature worms the stimulation is prolonged. The action of santonin is not affected by calomel. In concentrations of 10^{-5} to 10^{-7} santonin causes reversible paralysis of the rhythmic activity of the body and the abdominal muscle of *Hirudo medicinalis* but the dorsal muscle reacts to saturated solution only. G.I.P.

(118o) For studies on the viability and development of helminth eggs in the soil, Sergeev illustrates a cylinder, 200 mm. long, made of longitudinal pieces of non-corrosive wire 4 mm. apart and held together at the top, bottom and centre by rings 37–40 mm. in diameter. Mesh of the same wire provides the bottom and 15 × 20 mm. "windows" are left on one side of the cylinder at the bottom and middle to allow small amounts of the soil sample to be taken out for testing, without disturbance of the sample. The ova can be put within the cylinder at various depths. When the cylinder is placed in the ground, the soil sample is open to natural conditions, yet, it is stated, cannot be reached by soil organisms. G.I.P.

(118p) The dust formed when dry contaminated soil was stirred or poured was sucked through a piece of moistened gauze or a preliminary plankton filter placed at distances of 15–100 cm. on the table of Goodman's funnel attached to a hydrojet pump or vacuum cleaner. From 9 to 102 Ascaris ova were found per filter in the five different experiments. This is a new method for examining air dust for helminth ova. G.I.P.

119—Medycyna Doświadczalna i Mikrobiologia. Warsaw.

a. JEZIORAŃSKA, A. & DOBROWOLSKA, H., 1957.—"Odczyny immunologiczne w glistnicy." **9** (2), 167–177. [English & Russian summaries pp. 176–177.]

(119a) Complement fixation tests with saline extracts of fresh and dried ascaris, from man and pig, of trichina cysts and of strobilae of *Taenia saginata* and three chemical fractions of *Ascaris suis* were carried out with homologous and heterogeneous immune sera and with sera from infected patients. The antigens of fresh and dried parasites showed no difference in serological activity but the plain saline extracts were more active than the chemical fractions. Serological tests made during the course of intestinal infection of man by *Ascaris lumbricoides* were of no diagnostic value. The presence of antibodies was demonstrated during larval migration in rabbits experimentally infected with *Ascaris suis* eggs. The antibodies were most abundant between the 9th and 24th day after infection. [From authors' summary.] R.T.L.

120—Memorias de la Sociedad de Ciencias Naturales La Salle.

a. LÓPEZ-NEYRA, C. R. & DÍAZ-UNGRÍA, C., 1957.—"Cestodes de Venezuela. III. Sobre unos cestodes intestinales de reptiles y mamíferos venezolanos." **17** (46), 28–63.

(120a) This is a report of tapeworms from wild animals in Venezuela. *Oochoristica insulaemargaritae* n.sp. from the Surinam lizard *Ameiva a. ameiva* from Margarita Island has, in comparison with other species with about 49–84 testes, a large scolex 0·9–1·15 mm. in diameter and large suckers measuring 0·3–0·32 mm. × 0·2 mm. to 0·415 mm. × 0·3 mm. *Inermicapsifer* (*Raillietina*) *demerariensis venezolanensis* n.var. from the porcupine *Coendou melanurus* is defined by its measurable characters. These are tabulated with those of other forms in the *Raillietina* group. The scolex is 340–380 μ in diameter and there are 76–104 testes and a maximum of 248 egg capsules per segment. Each capsule contains up to 20 eggs. Other species described or reported are *Oochoristica agamae* from *Iguana i. iguana*, *O.* (*Mathevotaenia*) *megastoma* from the monkey *Cebus nigrivitatus apiculatus*; cysticerci and their evaginated larvae belonging to *Taenia* (*Hydatigera*) *lyncis* from the leporid *Sylvilagus floridanus margaritae*; *Crepidobothrium gerrardi* from the snake *Eunectes murinus*; segments of an

Ophiotaenia sp. from *Boa hortulana cooki*; *O. calmettei* and *O. faranciae* from the snake *Bothrops atrox* and *Dibothriocephalus* (*Spirometra*) *mansonoides* from *Felis* (*Leopardus*) *pardalis melanurus*. López-Neyra & Díaz-Ungría also tabulate details of morphology and habitat for 44 species of *Oochoristica*. M.MCK.

121—Monatsschrift für Kinderheilkunde.

a. FRANK, K., 1957.—"Klinik der *Fasciola hepatica*-Infizierungen im Kindesalter." **105** (2), 46–49.

(121a) Frank reports three cases additional to that recorded in *Orvosi Hetilap*, **96**, 1394–1396, of *Fasciola hepatica* infection in children from the flood region of the river Raab in Hungary. All were from large farming families and spent long summer periods employed with animals on wet pastures. They were successfully treated with emetine injections. The recommended dosage is 1 mg. per kg. body-weight per day for 7–10 days. *F. hepatica* infection was also found in all, except the baby, in a family of eight near Pécs, bringing the number reported from Hungary to eleven. M.MCK.

122—Nachrichten des Naturwissenschaftlichen Museums der Stadt Aschaffenburg.

a. STADLER, H., 1957.—"Die Verbreitung des wasserbewohnenden Würmer (Vermes) in Unterfranken." No. 54, pp. 1–26.

(122a) Stadler lists with brief comments the helminth fauna including leeches recorded from collections of water and springs in the lower valley of the Main. M.MCK.

123—Nature. London.

a. SMILES, J. & TAYLOR, A. E. R., 1957.—"Induced fluorescence with acridine orange in nematode embryology." **179** (4554), 306–307.
b. DUKE, B. O. L., 1957.—"Experimental transmission of *Loa loa* from man to monkey." [Correspondence.] **179** (4574), 1357–1358.
c. DUTT, S. C., 1957.—"Development of female *Schistosoma spindale* in the guinea pig." [Correspondence.] **179** (4574), 1359.
d. SATHYANESAN, A. G., 1957.—"Parasitism in relation to the pituitary of *Ophicephalus punctatus* and *Barbus stigma*." [Correspondence.] **180** (4576), 98–99.
e. SHEPHERD, A. M., 1957.—"Development of beet eelworm, *Heterodera schachtii* Schmidt, in the wild beet, *Beta patellaris*." [Correspondence.] **180** (4581), 341.

(123a) By using acridine orange as a vital fluorochrome, Smiles & Taylor have been able to describe the colour differential fluorescence of the nucleoli and other structures and the cytoplasmic inclusions of the oogonia, oocytes and early embryos of *Litomosoides carinii*. R.T.L.

(123b) Using *Chrysops silacea* fed on a human case infected with *Loa loa* Duke has succeeded in transmitting this infection to young monkeys *Mandrillus leucophaeus*. He finds, however, that the adult *Loa* in naturally infected *M. leucophaeus*, *Cercopithecus nictitans martini* and *C. mona mona* can be distinguished from that found in man by the larger size of the mature males and females and the nocturnal periodicity of the microfilariae. Inoculation of *M. leucophaeus* with infective larvae from wild *Chrysops langi* and *C. centurionis* (which never bite man) also gave rise to *Loa* with nocturnal periodicity. Duke concludes that the monkey population in the Cameroons rain forest is not an effective reservoir for the *Loa loa* of man. R.T.L.

(123c) Contrary to previous reports that only male *Schistosoma spindale* develop in guinea-pigs, Dutt obtained females in 17 and males in 22 guinea-pigs experimentally infected with the cercariae naturally discharged by *Indoplanorbis exustus*. That some of the females remained immature or were apparently destroyed after producing eggs is attributed to the occurrence in the guinea-pig of an individual immunity in varying degree. R.T.L.

(123d) Sathyanesan briefly reviews published work on the effect of parasitism on the functional relationship between the pituitary and the gonads in fish and describes his observations on *Ophicephalus punctatus*, in which he found a trematode in close proximity to the pituitary, and *Barbus stigma*, in which the pituitaries of two specimens were infested with a myxosporidian. In the specimen of *O. punctatus* the histological structure of the pituitary showed no abnormality but the testis was regressed with residuary spermatozoa in the seminal tubules. S.W.

(123e) Larvae of the beet eelworm *Heterodera schachtii* were added to pots containing single plants of *Beta patellaris*. About 15% of the larvae invaded the roots and of those about 65% developed to the intermediate stage and about 7% reached maturity, all the adults being males. No females were found nor any immature individuals which could with certainty be identified as female. H.R.W.

124—Nematologica.

a. SAUER, M. R. & GILES, J. E., 1957.—" Effects of some field management systems on root knot of tomato." **2** (2), 97–107.
b. GOODEY, J. B., 1957.—" *Hoplolaimus proporicus* n.sp. (Hoplolaiminae: Tylenchida)." **2** (2), 108–113. [German summary p. 113.]
c. PEACOCK, F. C., 1957.—" Studies on root knot nematodes of the genus *Meloidogyne* in the Gold Coast. Part II. The effect of soil moisture content on survival of the organism." **2** (2), 114–122.
d. HESLING, J. J., 1957.—" The hatching response of *Heterodera major* (O. Schmidt) to certain root diffusates." **2** (2), 123–125. [German summary p. 125.]
e. WINNER, C., 1957.—" Über die aktivierende Wirkung von Aminoacridinen auf *Heterodera schachtii*." **2** (2), 126–130. [English summary p. 130.]
f. APEL, A. & KÄMPFE, L., 1957.—" Beziehungen zwischen Wirt und Parasit im Infektionsverlauf von *Heterodera schachtii* Schmidt in kurzfristigen Topfversuchen. I. Infektionsgang bei verschiedenen Wirtspflanzen." **2** (2), 131–143. [English summary p. 142.]
g. LUC, M., 1957.—" *Radopholus lavabri* n.sp. (Nematoda, Tylenchidae) parasite du riz au Cameroun Français." **2** (2), 144–148. [English summary p. 148.]
h. FRANKLIN, M. T., 1957.—" Note on the nomenclature of the cereal root eelworm." **2** (2), 149–151. [German summary p. 151.]
i. TARJAN, A. C., 1957.—" Observations on *Ecphyadophora tenuissima* de Man, 1921." **2** (2), 152–158.
j. TAYLOR, D. P. & JENKINS, W. R., 1957.—" Variation within the nematode genus *Pratylenchus*, with the descriptions of *P. hexincisus* n.sp. and *P. subpenetrans* n.sp." **2** (2), 159–174. [German summary pp. 173–174.]

(124a) Four treatments were applied for three years to replicated field plots heavily infested with *Meloidogyne javanica* mixed with a small proportion of *M. hapla*. The treatments were: (i) a crop of susceptible tomatoes, (ii) a crop of resistant tomatoes (hybrids of *Lycopersicon peruvianum*×*L. esculentum*), (iii) clean fallow, (iv) summer fallow with winter cover crop of barley. The effects were assessed annually according to the degree of infestation of susceptible tomatoes grown in soil samples and, at the end of the period, by yields of susceptible and resistant tomatoes. It was found that resistant tomatoes did not reduce the nematode population sufficiently to make possible the successful cultivation of a subsequent susceptible crop, but the resistant tomatoes always gave a reasonable yield. Resistant tomatoes became more heavily attacked with repeated cultivation. Fallowing reduced the nematode population and the first susceptible crop gave a satisfactory yield but there was a big build up of nematodes on it. The green manure winter crop combined with summer fallow gave the same results. The population of *M. javanica* in the experimental area in Victoria failed to produce galls on *L. peruvianum* in the field and barley was also resistant as well as pepper and peanuts. M.T.F.

(124b) *Hoplolaimus proporicus* n.sp. is described and figured. It was found in rotten roots of *Elaeis guineensis*. It differs from its nearest relative *H. coronatus* in the absence of lateral fields, in the anterior position of the excretory pore and in the relative lack of longitudinal subdivision of the lowest head annule. J.B.G.

(124c) In laboratory experiments it was shown that larvae of *Meloidogyne* sp. did not survive in soil held at less than 13% of saturation for 12–48 hours. Egg masses did not survive a period of one to five days below 10% saturation, and few survived five to ten days at 100% saturation. If the nematodes were protected by unrotted plant material there was no effect when they were held at 13%–100% saturation for two to five days, but at 5% saturation practically all were killed. Applying these results to field conditions in the Gold Coast it was shown that, in the dry season, by digging the plots twice a week for some weeks before planting tomatoes, the soil moisture was reduced below the critical level for eelworm survival and a worth-while degree of control of root-knot was obtained. M.T.F.

(124d) The emergence of larvae of *Heterodera major* was not stimulated by root diffusate from oats, wheat, barley, rye, perennial ryegrass, Italian ryegrass, cocksfoot and Timothy. J.J.H.

(124e) Winner shows that some amino-acridines stimulate egg hatch of *Heterodera schachtii*. The results do not support the hypothesis that the hatching stimulus is correlated with the surface-activity or redox potential of the compounds tested. H.R.W.

(124f) A study of the invasion and development of *Heterodera schachtii* in roots of sugar-beet, summer turnip-rape, swede-rape and white mustard during the first 21 days of plant growth revealed that the number of larvae was greatest in swede-rape followed by white mustard, beet and turnip-rape. The different larval stages appeared at about the same time in the different host plants. Slow growth of root length contributed to high larval density. The larval density was highest in swede-rape, followed by turnip-rape, mustard and beet. Swede-rape is likely to be the most useful plant for pot tests. J.J.H.

(124g) *Radopholus lavabri* n.sp. from the roots of rice is described and figured. It differs from *R. gracilis* in that the lip region is clearly hemispherical, the spear is nearly twice as long, the spicules and gubernaculum are larger and the tail is fatter. J.B.G.

(124h) Franklin outlines the history of the nomenclature of the cereal root eelworm and gives her reasons for considering that, according to the International Rules of Zoological Nomenclature, its correct designation is *Heterodera major* (O. Schmidt, 1930) Franklin, 1940. M.T.F.

(124i) The description of *Ecphyadophora tenuissima* is emended. The nematode is now placed in the Neotylenchidae. Dimensions and figures are presented for specimens from various localities, and a neotype male is designated from a locality in Holland. J.B.G.

(124j) *Pratylenchus hexincisus* n.sp. from maize and *P. subpenetrans* n.sp. from the roots of pasture grasses are described and figured. The former is unique in having six incisures in the lateral field. The latter is characterized by its small size, the shape of the spicules, the backward extension of the lateral margins of the cephalic skeleton, and the abundance of males. The variations shown by measurements and body ratios of *P. penetrans*, *P. zeae*, *P. hexincisus* and *P. subpenetrans* are presented in tabular and graphic form. A plea is made for the presentation, in descriptions of species, of the mean value of length, the standard deviation of the mean, and the range of these values. J.B.G.

125—New England Journal of Medicine.

a. SPINGARN, C. L., EDELMAN, M. H., GOLD, T., YARNIS, H. & TURELL, R., 1957.—"Value of rectal biopsies in the diagnosis and treatment of *Schistosoma mansoni* infections." **256** (7), 290–294.

(125a) *Schistosoma mansoni* eggs were found by rectal biopsy in 99 and by stool examination in 88 of 106 infected Puerto Ricans. Rectal biopsy was quicker than stool examination and usually only one biopsy was required per person as compared with several stool examinations in many cases. After intensive fouadin treatment there was an increase in the dead

eggs and decrease in live eggs in rectal biopsies. Negative biopsies, but positive stools, were observed in seven persons and biopsies containing only degenerated eggs were associated with viable eggs in the stools in 11 cases. M.MCK.

126—New Zealand Journal of Agriculture.

a. MILLER, J. A., 1957.—" Hydatid disease: dosing dogs." **94** (5), 437, 439, 441.
b. THOMAS, P. L. & FOLLEY, E. J. H., 1957.—" Indiscriminate dosing of pigs with phenothiazine not recommended." **94** (5), 458.

(126a) Although arecoline hydrobromide pills are issued when dogs are registered annually in New Zealand, the incidence of hydatid disease is on the increase. Under the Meat Act the practice of feeding raw offal to dogs is illegal but many owners still give them the raw livers and lungs of sheep killed on the farm and fail to dose their dogs every three months. As many find the administration of arecoline tablets difficult, Miller gives a graphic description of the procedure and illustrates this by eight striking photographs. R.T.L.

(126b) Controlled experiments show that the dosing of young pigs with phenothiazine, when worm-free but unthrifty, does not promote their growth and that sodium fluoride or piperazine is a more effective treatment for ascaris. R.T.L.

127—New Zealand Veterinary Journal.

a. THOMAS, P. L. & ELLIOTT, D. C., 1957.—" The use of fine-particle phenothiazine against *Trichostrongylus colubriformis* in sheep with observations on its use against other species of worms." **5** (2), 66–69.

(127a) Sixty Romney hoggets, about six months old, carrying light naturally acquired mixed infections of gastro-intestinal nematodes, were given 60,000 *Trichostrongylus colubriformis* larvae by a stomach tube and divided into four groups of 15 each. One group was kept as controls. Twenty-three days later those in the three other groups received respectively, by stomach tube, 20 gm. of phenothiazine of 1 μ, 4 μ and 10 μ particle size. Clear evidence was obtained that particle size of 4 μ or less was superior to that of 10 μ but particles under 4 μ gave no greatly increased anthelmintic effect against *Trichostrongylus colubriformis*. 4 μ particles were apparently optimum against *Haemonchus contortus* and *Cooperia* sp. The finest particle was the best against *T. axei* and the only one to give a highly significant reduction of *Ostertagia* sp. If particle size is less than 10 μ the activity against *Oesophagostomum* spp. and *Chabertia ovina* may fall. It is suggested that an ideal phenothiazine preparation should contain 70% of particles under 5 μ or 90% under 10 μ, with the remainder made up by particles up to 30 μ. R.T.L.

128—North American Veterinarian.

a. HARDENBERGH, J. G., 1957.—" Surgical hemorrhage following castration of pigs wormed with sodium fluoride: a report." **38** (2), 41.
b. GOLDSBY, A. I. & TODD, A. C., 1957.—" Helminth infections in Wisconsin market-weight swine." **38** (4), 101–104.
c. ENZIE, F. D., FOSTER, A. O. & COLGLAZIER, M. L., 1957.—" Teniacides in dogs and cats." **38** (4), 119–128.
d. TROMBA, F. G., SIPPEL, W. L. & MITCHELL, F. E., 1957.—" Paralysis in a pig caused by a kidney worm." **38** (5), 134–135.
e. GOLDSBY, A. I. & TODD, A. C., 1957.—" A new swine anthelmintic." **38** (5), 140–144.

(128b) The incidence and average level of helminth infection in 101 market pigs in Wisconsin are tabulated; 46,797 helminths belonging to 11 genera were collected and the number of worms of each genus is listed. As pigs carrying 463 worms were classified as healthy on clinical examination, such examination alone cannot measure the effects of parasitism. In Wisconsin, treatment is directed against ascaris only; the other 10 genera escape attention as factors in swine production. R.T.L.

(128c) The relative merits of Anthelin, Anthol, Drocarbil, Dichlorophen and arecoline hydrobromide as taeniacides in dogs and cats are discussed. Their evaluation is difficult as uniform methods of testing and comparable criteria of efficiency have not been followed by investigators. It is important to recover all scolices and to match detached scolices with incomplete strobilae. In trials involving *Dipylidium*, precautions should be taken to eliminate fleas and lice by the use of insecticides at least a fortnight prior to medication. Drocarbil is the safest and most efficient against *Taenia* spp. and *Dipylidium* spp. Anthelin is potentially toxic although it is perhaps the most potent agent against *Taenia* and *Dipylidium*. Arecoline hydrobromide is the drug of choice against *Echinococcus granulosus*. Anthol, which contains Anthelin and toluene, caused vomiting in the seven dogs treated. R.T.L.

(128d) Posterior paralysis in a pig from Madison, Florida, was due to a *Stephanurus dentatus* in the lumbar portion of the spinal canal. There were immature worms and thrombi in the portal and hepatic veins, numerous lesions in the cirrhotic and enlarged liver and many lesions, containing immature worms, in the perirenal fat, psoas and lumbar muscles. R.T.L.

(128e) Hygromycin when given as a continuous low-level addition to the food of pigs appears partly to fulfil the requirements of an anthelmintic. In trials on four pigs receiving the purified antibiotic at the rate of 2 gm. per 100 lb. of ground feed the average number of eggs of *Metastrongylus* per gramme of faeces fell to zero in approximately two weeks. Medication was discontinued after 72 days and there was no increase in the egg count 30 days thereafter. The pre-treatment average of *Oesophagostomum* egg counts was depressed but regained when medication was discontinued. The average egg counts of *Trichuris* and *Strongyloides* were also depressed and did not increase after treatment ceased. The effect on the *Ascaris* egg counts was difficult to evaluate. The antibiotic was non-toxic and the pigs gained an average of 1·1 lb. each per day. R.T.L.

129—Parasitologische Schriftenreihe. Jena.

a. SPREHN, C. E. W., 1957.—" Helminthen und Helminthiasen des Schweines." No. 7, 170 pp.

(129a) In this monograph on the helminth parasites and helminthiases of pigs, Professor Sprehn, with the conciseness and preciseness which characterized his "Lehrbuch der Helminthologie", sets out, firstly, the extent and harmfulness of helminth infections in pigs, the methods of diagnosis and the general principles for their control. This is followed by a short description of the morphology, life-history and geographical distribution of each individual species under its appropriate genus, subfamily and family, the synonyms under which each has appeared from time to time and the names of authors of relevant publications. With few exceptions each species is accompanied by a text figure. It is interesting to note that since the publication of Sprehn's text book in 1932 the number of helminth species recorded for pigs has risen from 55 to 72 (excluding Pentastomids of which one in 1932 and two in 1957 are treated by Sprehn as helminths) and that no less than 18 species are common to man and pigs. Consideration is then given to the symptoms, diagnosis and curative and preventive treatment of each of the various helminth diseases of the stomach, intestine, liver, pancreas, kidney, peritoneum and connective tissues, lungs, blood circulation and eye caused by adult worms. This is succeeded by a brief survey of the symptoms, diagnosis and prevention of those infections due to helminth larvae. There follow separate keys for the diagnosis of all the trematode, cestode and nematode species, an alphabetical list of genera and species and their synonyms, and a very comprehensive list of references. R.T.L.

130—Parasitology.

a. JOHRI, L. N., 1957.—" On a new cyclophyllidean cestode, *Multiceps smythi* n.sp., from dogs in Dublin, Eire." **47** (1/2), 16–20.
b. JOHRI, L. N., 1957.—" A morphological and histochemical study of egg formation in a cyclophyllidean cestode." **47** (1/2), 21–29.

c. LLEWELLYN, J., 1957.—" The mechanism of the attachment of *Kuhnia scombri* (Kuhn, 1829) (Trematoda: Monogenea) to the gills of its host *Scomber scombrus* L., including a note on the taxonomy of the parasite." **47** (1/2), 30–39.
d. BAUGH, S. C., 1957.—" On the morphology of *Neogyrodactylus indicus* n.g., n.sp., a viviparous monogenetic trematode (fam. Gyrodactylidae) from *Argulus indicus* Weber." **47** (1/2), 40–45.
e. THOMAS, R. J., 1957.—" A comparative study of the infective larvae of *Nematodirus* species parasitic in sheep." **47** (1/2), 60–65.
f. ERASMUS, D. A., 1957.—" Studies on phosphatase systems of cestodes. I. Studies on *Taenia pisiformis* (cysticercus and adult)." **47** (1/2), 70–80.
g. ERASMUS, D. A., 1957.—" Studies on phosphatase systems of cestodes. II. Studies on *Cysticercus tenuicollis* and *Moniezia expansa* (adult)." **47** (1/2), 81–91.
h. REES, G., 1957.—" *Cercaria diplostomi phoxini* (Faust), a furcocercaria which develops into *Diplostomulum phoxini* in the brain of the minnow." **47** (1/2), 126–137.
i. SPEDDING, C. R. W. & MICHEL, J. F., 1957.—" The study of the transmission of the cattle lungworm (*Dictyocaulus viviparus*) in relation to pasture conditions." **47** (1/2), 153–159.
j. YEH, L. S., 1957.—" On a filarial parasite, *Deraïophoronema freitaslenti* n.sp., from the giant anteater, *Myrmecophaga tridactyla* from British Guiana, and a proposed reclassification of *Dipetalonema* and related genera." **47** (1/2), 196–205.
k. DINNIK, J. A. & DINNIK, N. N., 1957.—" Development of *Paramphistomum sukari* Dinnik, 1954 (Trematoda: Paramphistomidae) in a snail host." **47** (1/2), 209–216.

(130a) *Multiceps smythi* n.sp. from dogs in Dublin is characterized by 44 rostellar hooks. The large hooks are 220–238 μ and the small hooks 140–150 μ. The testes number 286–310 occupying all parts of the segment except the poral, posterior portion. The uterus has 16–19 branches on each side. R.T.L.

(130b) Johri describes the morphology and histochemistry of the ovary, vitelline glands, Mehlis' gland and eggs of *Multiceps smythi*. The ova and vitelline cells contain acidophil protein but are free from the phenolic-protein globules present in Pseudophyllidea. Tests for sclerotin and chitin in the embryophore were negative and it is tentatively concluded that a kerotin type of protein may be present. Mehlis' gland secretion is strongly positive to P.A.S., stable to amylase and free from lipid. It is considered unlikely that its function is directly concerned with the formation either of the shell or of the embryophore. R.T.L.

(130c) Llewellyn describes in detail the mechanism by which *Kuhnia scombri* adheres to the gills of the mackerel *Scomber scombrus*. A pair of hooks perforate three or four secondary gill lamellae and four pairs of hinged clamps grasp one or two secondary lamellae. It is pointed out that as the description differs considerably from that given by Sproston her classification of the Diclidophoroidea is open to criticism. R.T.L.

(130d) *Neogyrodactylus indicus* n.g., n.sp., was taken from the ventral surfaces of the copepod *Argulus indicus* parasitic on the fish *Ophicephalus marulius* in West Bengal. The new genus is viviparous and greatly resembles *Gyrodactylus*. The hooks of the opisthaptor are supported by a single bar, whereas in *Gyrodactylus* there are two bars; complementary armature with plates and filaments, which are present in *Gyrodactyloides*, are absent in *Neogyrodactylus*. R.T.L.

(130e) The infective larvae of *Nematodirus spathiger*, *N. filicollis* and *N. battus* differ only in size and in the configuration of the tail. Their measurements are tabulated and their characteristic posterior ends are figured. The tail of the larvae of *N. battus* is finely pointed. The larval tails of *N. spathiger* and *N. filicollis* are forked and blunt but can be distinguished from each other by their length and the length of the sheath tail. R.T.L.

(130f) Erasmus could not demonstrate acid or alkaline phosphatase in the cysticercus of *Taenia pisiformis* by histochemical methods, though biochemical tests showed the presence of both enzymes with acid phosphatase predominating. In the adult both enzymes were demonstrated histochemically in the region of the mature proglottides. The acid phosphatase was confined to the cuticle, but the alkaline enzyme was found in the cuticle, subcuticular cells and in the membranes surrounding the ovary and vitelline tubules. In biochemical tests the alkaline enzyme predominated in aqueous extracts of tissues of the adult worm. W.P.R.

(130g) Erasmus could not demonstrate phosphatases in *Cysticercus tenuicollis* by histochemical means, though biochemical tests showed the presence of both enzymes in aqueous extracts. In adult *Moniezia expansa*, acid and alkaline phosphatases occurred in the cuticle. Alkaline phosphatase only was present in the tunicae enclosing the ovary, vitelline gland and testes. In the interproglottidal glands, in the wall of the developing uterus and in the subcuticular cells it was again the only phosphatase present. The activity in the cuticle was shown to originate in the walls of a branched system of channels. Entire *Moniezia* hydrolysed sodium α-naphthyl phosphate in the medium in which the worms were incubated. Some biochemical characteristics of the phosphatases in aqueous extracts of the parasites are given. W.P.R.

(130h) *Cercaria diplostomi phoxini* from *Limnaea pereger* is described and figured in detail and compared with seven closely related forms. When minnows were infected experimentally the cercariae migrated to the brain causing cerebral haemorrhages and became fully developed *Diplostomulum phoxini* in about 28 days after entering the fish. R.T.L.

(130i) Spedding & Michel have investigated, during the two-year period June, 1954 to June, 1956, the effect of the length of pasture herbage on the transmission of *Dictyocaulus viviparus* and here report on the first year's experiments. Short grass was produced by (i) grazing by resistant cattle, (ii) grazing by sheep and (iii) gang-mowing; other paddocks were left long. The paddocks were infected by allowing infected calves to graze them for one to two weeks; two weeks later the test calves were put on to them. The results are expressed in terms of "Transmission" (mean post-mortem worm count of test calves divided by mean faecal larval count of infecting calves), "Translation" (mean grass count, i.e. larvae per lb. of herbage, divided by mean faecal larval count of infecting calves) and "Acquisition" (mean post-mortem worm count of test calves divided by mean grass count). In the summer and autumn translation appeared to be the major factor in transmission whereas in the spring acquisition was more important. Translation and Acquisition Coefficients tended to vary inversely in these experiments although each coefficient followed a similar pattern in all three experiments. Nevertheless, the numbers of larvae actually on the grass were more important as a guide to the severity of infection produced than the numbers being passed on to it. S.W.

(130j) *Deraïophoronema freitaslenti* n.sp. from the mesentery of *Myrmecophaga tridactyla* is closely allied to *D. spirale* (Molin) but the short curved right spicule is three times longer (0·16 mm. long) and there are four pairs of pre-cloacal papillae, six pairs of post-cloacal papillae, a median pre-cloacal papilla and a pair of papillae behind the cloaca. Yeh does not accept the definitions given by Chabaud (1952) and Webber (1955) for the genus *Dipetalonema* which according to them contains about 40 species of heterogeneous character. He submits a key to the genera formerly considered as *Dipetalonema* s.lat., restoring as valid *Deraïophoronema*, *Tetrapetalonema*, *Mönnigofilaria*, *Breinlia*, *Dipetalonema* s.str. and *Acanthocheilonema*, and erects a new genus *Johnstonema* for *Dipetalonema annulipapillatum* Johnston & Mawson, 1938 in marsupials, which has short, stout, similar and sub-equal spicules. *Molinema* is a synonym of *Acanthocheilonema*. The following new combinations are made, *Acanthocheilonema anticlavum* (Molin, 1858), *A. arbuta* (Highby, 1943), *A. procyonis* (Price, 1955), *A. sprenti* (Anderson, 1953), *Breinlia capilliformis* (Baylis, 1934), *B. dasyuri* (Johnston & Mawson, 1938), *B. johnstoni* (Mackerras, 1954), *B. robertsi* (Johnston & Mawson, 1938), *B. spelacea* (Leidy, 1875), *B. thylogali* (Mackerras, 1954), *Johnstonema annulipapillatum* (Johnston & Mawson, 1938), *Mönnigofilaria blanci* (Chabaud, 1952), *M. digitata* (Chandler, 1929), *M. rodhaini* (Peel & Chardome, 1947), *M. streptocerca* (Macfie & Corson, 1922), *M. sunci* (Sandground, 1933), *Deraïophoronema spirale* (Molin, 1860), *Tetrapetalonema perstans* (Manson, 1891) and *T. vanhoofi* (Peel & Chardome, 1946). *A. tatusi* (Mazza & Anderson, 1926) is a synonym of *Acanthocheilonema anticlavum* (Molin, 1858). R.T.L.

(130k) *Paramphistomum sukari* is wide-spread in native cattle in the Kikuyu and Masai Reserves and the Northern Frontier Province of Kenya. It has also been found in cattle in

Ankole and Karamoji in Uganda. A detailed description is now given of its various developmental stages in *Biomphalaria pfeifferi*. Laboratory-bred *B. pfeifferi nairobiensis* and *B. sudanica tanganikana* could not be infected experimentally. Young rediae emerged from the sporocysts 14 days after exposure of the mollusc to miracidia and the first rediae containing daughter rediae were recovered from the liver 19 days after infection. By the 25th day, rediae of the first generation had given rise to cercariae and many of the rediae of the second generation contained both rediae and cercariae. On the 35th day, besides the first and second generation rediae there were very many young rediae each containing embryo balls and one cercarial or redial embryo, apparently of the third generation. After they leave the redia the cercariae require about 10 days to mature and they emerge from the mollusc 35 days after infection. This succession of rediae maintains the infection of the intermediate host for a long period.

R.T.L.

131—Phytopathology.

a. FERRIS, J. M., 1957.—" Effect of soil temperature on the life cycle of the golden nematode in host and nonhost species." **47** (4), 221–230.
b. REYNOLDS, H. W. & HANSON, R. G., 1957.—" Rhizoctonia disease of cotton in presence or absence of the cotton root-knot nematode in Arizona." **47** (5), 256–261.
c. ROHDE, R. A. & JENKINS, W. R., 1957.—" Host range of a species of *Trichodorus* and its host-parasite relationships on tomato." **47** (5), 295–298.
†d. DROLSOM, P. N., MOORE, E. L. & CLAYTON, E. E., 1957.—" Resistance to two *Meloidogyne* species in breeding lines of flue-cured tobacco." **47** (5), 312.
†e. GOOD, J. M. & PARHAM, S. A., 1957.—" Control of sting nematodes on upland cotton by soil fumigation." **47** (5), 312.
†f. MINTON, N. A. & CAIRNS, E. J., 1957.—" Suitability of soybeans var. Ogden and twelve other plants as hosts of the spiral nematode." **47** (5), 313.
†g. MOUNTAIN, W. B. & BOYCE, H. R., 1957.—" Parasitic nematodes in relation to the peach replant problem in Ontario." **47** (5), 313.
†h. NIELSEN, L. W. & SASSER, J. N., 1957.—" The relationship of nematocides, dosage, carrier, and soil types to the control of root knot in sweetpotato." **47** (5), 314.
††i. MORGAN, O. D., 1957.—" The effect of various control measures on two parasitic nematodes of strawberry." **47** (7), 452.
††j. SHANDS, Jr., W. A. & CRITTENDEN, H. W., 1957.—" The influence of nitrogen and potassium on the relationship of *Meloidogyne incognita acrita* and soybeans." **47** (7), 454.

(131a) At 85° F. the larvae of the golden nematode *H. rostochiensis* did not develop, or continue development begun at lower temperatures in the host plants *Solanum tuberosum*, *S. dulcamara*, and *S. integrifolium*. At 65°F. and 75°F. larvae reached maturity in these host species. At 65 F. a few larvae developed beyond the second stage in the non-host *S. citrullifolium*, but none reached maturity. The largest number of larvae entered *S. tuberosum*, followed by *S. demissum* and *S. integrifolium*. Development of the early larval stages of the nematodes was more rapid at 75°F. than at 65°F. but eggs were first formed at 65°F. Histological observation of the plant roots showed that in *S. citrullifolium* the invading larvae did not reach the plant stele, and produced no giant cells. At temperatures favourable for development, the nematodes in *S. dulcamara* and *S. tuberosum* caused giant cell formation to commence at the time of entry of the root. In *S. dulcamara* giant cell development in the central cylinder appeared to cause the roots to swell, but in *S. tuberosum* where giant cell masses up to 1 mm. in length were produced, the roots did not swell, although the vascular cylinder became filled with giant cells.

J.J.H.

(131b) Post-emergence damping off of cotton seedlings in Arizona, due to the fungus *Rhizoctonia solani* Kühn, was shown experimentally to be more severe in plants weakened by the presence of the root-knot nematode *Meloidogyne incognita* var. *acrita*, or by mechanical

†Abstract of paper presented at the Annual Meeting of the Southern Division of the American Phytopathological Society, Birmingham, Ala., February 4–6, 1957.

††Abstract of paper presented at the 14th Annual Meeting of the Potomac Division of the American Phytopathological Society, Beltsville, Md., February 28, 1957.

damage, than in vigorously growing plants. Damping off in nematode infested soil was significantly reduced by nematicides. A survey of field-grown plants showed that those with the highest root-knot rating were the most severely affected by *Rhizoctonia* and were shortest. M.T.F.

(131c) From green-house tests 42 plants are reported as hosts of varying efficiency of the stubby root nematode *Trichodorus* sp. [probably *T. christiei* Allen, 1957]. Of the plants tested only four were non-hosts. On tomatoes *Trichodorus* had a stunting effect and malformation of lateral roots. Damage to roots was caused by lessened cell division in root tips. On agar plates bearing tomato and rye roots the eelworm fed by sucking the contents of epidermal and outer cortical cells. J.B.G.

(131d) Breeding lines of flue-cured tobacco of a good type and giving satisfactory yields have been developed and tested in the green-house for resistance to five species of *Meloidogyne*. The results with *M. hapla* and *M. javanica* were inconclusive but showed high resistance to *M. incognita* and *M. incognita* var. *acrita* and susceptibility to *M. arenaria*. M.T.F.

(131e) Plots fumigated with Dowfume W-40, Nemagon, Dorlone, and D-D gave significantly greater yields of Plains cotton than unfumigated plots. Populations of *Belonolaimus gracilis* were significantly lowered by Dowfume W-40 and Nemagon. At the end of the experiment Nemagon-treated plots carried hardly any nematodes. J.B.G.

(131f) Soya bean var. Ogmore grown in the green-house and inoculated with 500 *Helicotylenchus nannus* grew significantly less roots than control plants. Seed yields were not significantly different. Nematode populations increased about tenfold. *H. nannus* multiplied on cotton, Ladino clover, oats, grain, sorghum and on the grasses, Dallis, Bermuda, nut, Johnson, fescue, Sweet Sudan and orchard. Visible root damage occurred only on the soya beans. J.B.G.

(131g) Survey of about 10% of peach orchards in S.W. Ontario showed that only *Pratylenchus penetrans* is related to the replant problem. Fumigation with D-D controlled *P. penetrans* for two years and increased peach growth. Soil of most commercial peach nurseries is infested. J.B.G.

(131h) Treatment of light and intermediate soils with Dowfume W-85 and D-D for control of root-knot gave increased yields of sweet-potato. There was no evidence of control in heavy soil. Fumigants impregnated on vermiculite were more efficient at the lower doses than were the comparable liquid treatments but they adversely affected yields at the high dosage. This adverse effect was most serious in heavy soil. H.R.W.

(131i) In the Robinson variety of strawberry, root-knot due to *Meloidogyne hapla* and brown root rot caused by *Pratylenchus* sp. were partally controlled (i) by treatment, in the autumn, with D-D at 60 gal. per acre, (ii) by heat treatment of half the plants in a test area and (iii) by applying a dry formulation of 20% Nemagon at 68 lb. and 136 lb. per acre. R.T.L.

(131j) Tests on the soya bean varieties Anderson, Wabash and Adams, respectively resistant, moderately susceptible and susceptible to *Meloidogyne incognita acrita*, showed that with the addition of nitrogen and potassium there was a general increase in the penetration of this eelworm larva into the Anderson variety (although galls were not present) and in the amount of gall formation on the Wabash and Adams varieties. The addition of legume bacteria increased penetration of the Anderson variety and the amount of galls on the Adams variety. R.T.L.

132—Plant Disease Reporter.

a. SLACK, D. A., SEYMOUR, C., FIELDS, H. & FULTON, J. P., 1957.—" Summer dwarf of strawberry." **41** (5), 398–401.
b. MAI, W. F., DOLLIVER, J., KIRKPATRICK, J. D. & PARKER, K. G., 1957.—" Nematode genera found in New York State orchards." **41** (5), 402–404.
c. BAINES, R. C., SMALL, R. H., DEWOLFE, T. A., MARTIN, J. P. & STOLZY, L. H., 1957.—" Control of the citrus nematode and *Phytophthora* spp. by Vapam." **41** (5), 405–414.
d. CHITWOOD, B. G. & BIRCHFIELD, W., 1957.—" Citrus-root nematode a native to Florida soils." **41** (6), 525.
e. THOMAS, H. A., 1957.—" Some initial findings on nematodes on peaches in New Jersey." **41** (6), 526.
f. TAYLOR, A. L., FELDMESSER, J. & FEDER, W. A., 1957.—" A new technique for preliminary screening of nematocides." **41** (6), 527–530.
g. STOLLER, B. B., 1957.—" An improved test for nematodes in the soil." **41** (6), 531–532.
h. NORTON, D. C., 1957.—" *Radopholus gracilis* in a dry subhumid environment." **41** (7), 599.
i. WEST, J. A., 1957.—"Recommended changes in recovery techniques for burrowing nematode." **41** (7), 600–602.
j. CHITWOOD, B. G. & ESSER, R. P., 1957.—" Pathogenicity tests involving *Meloidodera floridensis*, a nematode associated with slash pine." **41** (7), 603–604.
k. OTEIFA, B. A. & EL-GINDI, D. M., 1957.—" Effect of irrigation frequency and size of tomato seedlings on root knot index." **41** (7), 605–607.

(132a) Summer dwarf of strawberries caused by *Aphelenchoides besseyi* was observed in Arkansas in 1954 and 1955. Symptoms in the field appeared in August and were most pronounced after mid-September until mid-December. The chief variety grown is Blakemore. Yields were reduced and misshapen fruit produced. The disease was fairly wide-spread and occurred in plants originating in Arkansas, Tennessee, Oklahoma, Missouri and Maryland. M.T.F.

(132b) Potentially pathogenic nematodes were found throughout New York State in almost all orchard soils. The occurrence or number of these nematodes does not necessarily demonstrate the presence of a nematode problem. J.J.H.

(132c) *Tylenchulus semi-penetrans* was effectively controlled by the application of Vapam (sodium n-methyl dithiocarbamate) to the soil of citrus groves. The chemical was applied at various rates but 274 to 475 pounds of Vapam per acre, applied as a drench in six to 12 inches of water, was effective. The lower doses were effective on sandy loams and the higher on loams. Injection or application of Vapam to the soil surface followed by sprinkling of water was not effective. Vapam is water soluble and moves through the soil in water. It is adsorbed by the soil within 24 hours or changed to insoluble compounds. J.B.G.

(132d) The citrus-root nematode, *Tylenchulus semi-penetrans* was found on a new host, climbing hempweed (*Mikania batatifolia*) in Florida. H.R.W.

(132e) Thomas lists the genera of nematodes found in samples from several peach orchards in New Jersey. H.R.W.

(132f) Mixed populations of *Rhabditis* sp. and *Panagrellus* sp. were used as test organisms in the screening of nematicides. The nematodes are shaken up with measured quantities of sand, water and nematicide in a glass vial and stored for 48 hours at 20° C. Nematodes are judged to be alive if they are moving and they are counted as dead if they show signs of disintegration after two or three days in a dish at room temperature. It is claimed that this technique can demonstrate the toxicity of chemicals in solid, liquid or vapour phases. H.R.W.

(132g) Nematodes pass through a filter in a funnel containing a soil sample as in the Baermann funnel technique. Stoller has added a refinement to this method by collecting the nematodes in polythene tubing nine inches long. It is claimed that this method enables the size of the soil sample to be increased. Furthermore the concentration of nematodes to be examined is higher and the nematodes store easily in the plastic tubes with no loss by evaporation., and the thin plastic sheeting allows exchange of respiratory gases. H.R.W.

(132h) *Radopholus gracilis* was found in a clay loam soil in a dry subhumid region of Texas. Norton points out that this observation is of interest because this nematode is usually associated with moist environments. H.R.W.

(132i) Experiments showed that by incubating citrus roots in water for 24 hours, 80% of the eelworms were extracted. This number takes five days to come out in the moist chamber method. By the water method 90% were extracted in 48 hours. J.B.G.

(132j) Ten seedlings of *Pinus elliottii* were each inoculated with two gravid female *Meloidodera floridensis*. After eight months the roots were washed and examined. An average of 34·7 mature female *Meloidodera* was found on each plant. The soil from each pot yielded an average of 297 larvae per pot. The washed roots incubated at room temperature for three days gave an average of 359 larvae per plant. Only three males were found. There was a slight, non-significant increase in root growth of infested plants as compared with non-infested. M.T.F.

(132k) Field experiments showed that the degree of infestation of tomato plants with root-knot eelworm (*Meloidogyne* sp.) increased with frequency of irrigation. Size of seedling did not have any influence on the degree of infestation. H.R.W.

133—Plant Disease Reporter. Supplement.

a. LITZENBERGER, S. C. & STEVENSON, J. A., 1957.—" A preliminary list of Nicaraguan plant diseases." No. 243, pp. 1–19.

(133a) In this list of Nicaraguan plant diseases nematodes [unspecified] are mentioned as infesting *Beta vulgaris*, *Brassica oleracea capitata*, *Crotalaria striata*, *Daucus carota* and *Lycopersicon esculentum*. M.T.F.

134—Poultry Science.

a. EDGAR, S. A. & TEER, P. A., 1957.—" The efficacy of several compounds in causing the elimination of tapeworms from laboratory-infected chickens." **36** (2), 329–334.
b. EDGAR, S. A., DAVIS, D. C. & FRAZIER, J. A., 1957.—" The efficacy of some piperazine compounds in the elimination of helminths from experimentally- and naturally-infected poultry." **36** (3), 495–510.
c. SHUMARD, R. F., 1957.—" The toxicity to chickens and the anthelmintic effect of two forms of a piperazine-carbon disulfide complex on *Ascaridia galli* and *Heterakis gallinae*." **36** (3), 613–618.

(134a) From a large number of tests in which 269 chickens, experimentally infected with *Raillietina cesticillus* or *Choanotaenia infundibulum*, were treated in small batches either with a single dose or by continuous feeding, with di-n-butyl tin [DBT] oxide, DBT maleate, dibenzyl tin chloride or DBT sulphide, detailed data are presented and tabulated which confirm the efficacy and safety of these compounds as taeniacides for growing chickens. [Each percentage of cure is based on four to eight birds only.] R.T.L.

(134b) This paper sets out in considerable detail, supplemented by eight tables, the various results of a variety of experiments [which do not lend themselves to brief summary] on the efficacy of piperazine, principally as piperazine hexahydrate, in eliminating immature and mature *Ascaridia galli* from naturally and experimentally infected poultry, and immature *A. galli*, *A. dissimilis* and *Heterakis gallinae* from experimentally infected turkeys. R.T.L.

(134c) Piperazine-carbon disulphide complex as a powdered product (Parvex), containing 22% of the active ingredient, when mixed with food or as a liquid product added to drinking water, had a wide margin of safety for poultry as compared with its maximum effective dose against *Ascaridia galli*. Doses as high as 11,648 mg. per kg. of the powdered product were not lethal. 568 mg. of the powdered product or 0·47 ml. of the liquid removed 90% or more of *Ascaridia galli*, while dosages as high as 950 mg. per kg. of the powdered product and 0·93 ml. per kg. of the liquid failed to remove *Heterakis gallinae*. R.T.L.

135—Proceedings of the Alumni Association, Malaya.

a. DANARAJ, T. J., DA SILVA, L. S. & SCHACHER, J. F., 1957.—" The filarial complement-fixation test in eosinophilic lung (tropical eosinophilia). A preliminary report." **10** (2), 109–116.
b. SCHACHER, J. F. & DANARAJ, T. J., 1957.—" Creeping eruption, a non-patent, zoonotic helminthiasis in Singapore." **10** (2), 141–146.

(135a) Danaraj *et al.* performed complement fixation tests on the sera of 12 patients with tropical eosinophilia, using a 1% alcoholic extract of dried *Dirofilaria immitis* powder as antigen. All showed consistently positive reactions in high dilutions. Following treatment with diethylcarbamazine the titres gradually diminished and in all cases became negative. Sera from six patients were tested with Ascaris antigen but none showed any antibody response. The filarial complement fixation test was positive in relatively low titres in cases of filariasis bancrofti and of filariasis malayi and in dogs infected with *D. immitis*. Sera from a group of Asians and Americans who were asymptomatic, without eosinophilia and with no clinical or parasitological evidence of filariasis were negative. The authors discuss the possibility that filarial infections other than those normally occurring in man may be concerned in the aetiology of eosinophilic lung. S.W.

(135b) Schacher & Danaraj give a detailed report of a case of creeping eruption on the feet of an American schoolteacher in Singapore and mention four further cases which they observed subsequently. Treatment of the first case with hetrazan at a dosage of 2 mg. per kg. body-weight for four weeks (100 mg. thrice daily) rapidly relieved the itching and lessened the migratory progress of the lesion. Two weeks after the end of treatment all signs of the infection except slight linear depigmentation had vanished. *Ancylostoma braziliense* or *A. ceylanicum* were believed to be the causal agents but biopsies were not obtainable. S.W.

136—Proceedings of the Helminthological Society of Washington.

a. DAVIS, B. S. & VOGE, M., 1957.—" Observations on *Hymenolepis macyi* Locker and Rausch, with a revised diagnosis of this cestode." **24** (1), 1–4.
b. DOUVRES, F. W., 1957.—" The morphogenesis of the parasitic stages of *Trichostrongylus axei* and *Trichostrongylus colubriformis*, nematode parasites of cattle." **24** (1), 4–14.
c. PRICE, D. L., 1957.—" *Dirofilaria uniformis* n.sp. (Nematoda: Filarioidea) from *Sylvilagus floridanus mallurus* (Thomas) in Maryland." **24** (1), 15–19.

(136a) From an examination of the type specimen of *Hymenolepis macyi* from *Sorex vagrans* and other material collected from *S. ornatus* in California, Davis & Voge find that the cirrus is armed with numerous fine hairs, the testes are arranged in a triangle and the ovary is more or less transverse anterior to the vitellaria. The ovoid uterus is a unique structure bearing numerous fine lines giving its surface a hairy appearance. The diagnosis of the species is consequently revised. R.T.L.

(136b) The larvae of *Trichostrongylus axei* and *T. colubriformis* are alike in many anatomical features but at the third stage the tail ends of the larva and of the sheath in the former are bluntly rounded whereas those in the latter terminate in two tubercles of unequal length. The fourth-stage larvae cannot be distinguished but at the fourth moult the tail ends of the larva and of the sheath in *T. axei* are both bluntly rounded while in *T. colubriformis* the tail of the larva terminates in two tubercles of unequal length and the tail end of the sheath is rounded. Measurements of the various parasitic stages of both species are tabulated. R.T.L.

(136c) *Dirofilaria uniformis* n.sp., and its microfilaria, are described and figured from the cottontail rabbit *Sylvilagus floridanus mallurus* collected in Maryland, U.S.A. The sheathed microfilaria of *D. uniformis* is very similar to that of *D. scapiceps* except in its length. The males measure 11·5 mm. to 14·2 mm., and the females 22·6 mm. to 33·7 mm. The morphological differences between *D. uniformis* and *D. scapiceps* are however more obvious to the naked eye than under the microscope. The new species is straight and uniform in width whereas *D. scapiceps* is coiled in its entire length and tapers towards both ends. The spicules show marked variation in length and some variation in structure. R.T.L.

136—Proceedings of the Helminthological Society of Washington (cont.)

d. KRUEGER, H. J. & LINFORD, M. B., 1957.—" Sex differences in the cephalic region of *Hoplolaimus coronatus* (Nematoda, Tylenchida)." **24** (1), 20–23.
e. ROHRBACHER, Jr., G. H., 1957.—" The recovery of nematode larvae by Baermann apparatus as affected by a detergent." **24** (1), 24–25.
f. JACHOWSKI, Jr., L. A., 1957.—" Filariasis in American Samoa. VI. Survey of Swain's Island." **24** (1), 26–29.
g. MASSEY, C. L., 1957.—" Four new species of *Aphelenchulus* (Nematoda) parasitic in bark beetles in the United States." **24** (1), 29–34.
h. BRAVO-HOLLIS, M. & MANTER, H. W., 1957.—" Trematodes of marine fishes of Mexican waters. X. Thirteen Digenea, including nine new species and two new genera, from the Pacific Coast." **24** (1), 35–48.

(136d) Krueger & Linford describe and illustrate by photomicrographs and a semi-diagrammatic drawing the sexual dimorphism which they have observed in the cephalic region of *Hoplolaimus coronatus*. As well as differing in general form there appears to be a constant difference in the cephalic framework: there are six arched ribs which radiate backwards from the vestibule to the basal plate; of these the four lateral ones are unbranched but the single dorsal and ventral ribs are forked, dividing typically into two prongs in females and three in males. The biological significance of these differences is obscure. S.W.

(136e) The addition of Triton X-100, a non-ionic detergent, at the rate of 0·5 ml. to each litre of water used in the Baermann technique almost doubled the recovery of infective larvae of *Trichostrongylus axei* from crimson clover and of *Ostertagia ostertagi* from Bermuda grass and Orchard grass. The detergent had no apparent effect on the larvae. R.T.L.

(136f) Microfilariae of the non-periodic *Wuchereria bancrofti* were found in the blood of 15 out of 110 persons examined during a brief visit to Swain's Island. Filarial infections were present in three of the 105 *Aëdes polynesiensis* dissected; two contained second-stage larvae in the thoracic muscles and one had infective larvae in the head and mouthparts. Coconut waste stacked around banana plants provides thousands of small water containers which serve as breeding places for *A. polynesiensis*. R.T.L.

(136g) *Aphelenchulus barberus* n.sp. from *Dendroctonus barberi* and *D. frontalis* from beetle infested logs in the Talladego National Forest, *A. brevicomi* n.sp. from *D. brevicomis* in the Salmon National Forest, Idaho, *A. spirus* n.sp. from *Ips oregoni* in the Uncompahgre National Forest, Colorado, and *A. grandicolli* n.sp. from *Ips grandicollis* in the Tallagro National Forest, Alabama, are described and figured. The *A. spirus* female is similar to that of *A. diplogaster* but is larger and lacks a caudal mucro. *A. grandicolli* is similar to *A. tomici* but is much larger. The tail is more broadly rounded with a less distinct mucro and the distance of the vulva from the posterior end is greater. *A. barberus* and *A. brevicomi* are differentiated from one another by the tail of the female which in the former has a prominent mucro, the distance of the vulva from the posterior end is shorter. The male of *A. barberus* only has been collected. R.T.L.

(136h) Bravo-Hollis & Manter report on 13 species of digenetic trematodes from fish caught on the Pacific coast of Mexico. Those which are described and illustrated as new to science are as follows: *Lepidapedon epinepheli* n.sp. from *Epinephelus analogus*, *Hypocreadium myohelicatum* n.sp. from *Balistes capistratus*, *Guggenheimia pacifica* n.g., n.sp. from *B. verres* and *B. capistratus*, *Dactylotrema squamatum* n.g., n.sp., from *Gerres* sp., *Opegaster lutiani* n.sp. from *Lutianus aratus*, *Podocotyle musculometra* n.sp. from *Hoplopagrus güntheri*, *Helicometra pretiosa* n.sp. from *Paralabrax maculofasciatus*, *Phyllodistomum marinae* n.sp. from *Mycteroperca pardalis*, and *Diplangus mexicanus* n.sp. from *B. verres*. *Guggenheimia* is related to *Pseudocreadium* and *Hypocreadium* but is remarkable in that the mouth, oral sucker and genital pore are dorsally situated and the entire cirrus sac lies in front of the mouth. *Dactylotrema* is closely related to *Homalometron* but has the body elongate and covered with scales, each of which has one to five spines embedded in it, and a complex oral sucker surrounded by pointed finger-like papillae. A number of new host and locality records are reported. S.W.

136—Proceedings of the Helminthological Society of Washington (cont.)

i. CHITWOOD, B. G. & TARJAN, A. C., 1957.—" A redescription of *Atylenchus decalineatus* Cobb, 1913 (Nematoda: Tylenchinae)." **24** (1), 48–52.
j. CHITWOOD, B. G., 1957.—" A new species of *Xiphinemella* Loos, 1950, (Nematoda) from Florida." **24** (1), 53–56.
k. CHITWOOD, B. G., 1957.—" Two new species of the genus *Criconema* Hofmänner and Menzel, 1914." **24** (1), 57–61.
l. HAGEN, A. F. & OLSEN, O. W., 1957.—" Species and prevalence of parasites in the blood of the American magpie (*Pica pica hudsoni* (Sabine)) in northern Colorado." **24** (1), 61–62.
m. MEYL, A. H., 1957.—" Two new freeliving nematodes, found in the rain-water reserve of *Quesnelia arvensis* (Vell.) Mez. (Bromeliaceae) from Brazil." **24** (1), 62–66.
n. MARTIN, H. M., 1957.—" Studies on the anthelmintic value of 3,5-dimethyl-4-chlorophenol in dogs." **24** (1), 67–69.

(136i) *Atylenchus decalineatus* has been recorded once, but not redescribed since 1913. Cobb's original description is reproduced and emended. Four females and one male are now separately redescribed and figured from New Jersey and Florida. The genus *Atylenchus* has four clearly defined setae on the head which differentiate it from all other Tylenchina except *Eutylenchus* from which it is easily distinguished by 10 longitudinal ridges on the body and the absence of caudal alae on the male. R.T.L.

(136j) *Xiphinemella esseri* n.sp., from around the roots of the Spanish Oak *Quercus falcata*, the red maple *Acer rubrum* and the fern *Pteris aquilina* var. *latiuscula*, in Florida, differs from the type *X. ornatum* in the shorter length of the stylet (72–75 μ) and the greater number of supplementary organs (1 plus 8 or 9). The significance of finding a spare stylet tip in the adult male of *X. esseri* is discussed. A key is given for the seven genera of Tylencholaiminae Filipjev, 1934 of which Longidorinae is a synonym. R.T.L.

(136k) A key to 17 species of *Criconema*, now recognized, includes *Criconema decalineatum* n.sp. from *Ficus elastica*, in Florida, U.S.A., distinguished by the possession of 10 longitudinal rows of spines, 80 annules and stylet 66–85 μ long. In *C. spinalineatum* n.sp., from manila grass (*Zoysia matrella*) roots, in Florida, U.S.A., the spines are in 8 longitudinal rows and are mostly longer than wide, the vulva is at the 17–18th annule from the end, the annules number 89 and the stylet is 40 μ long. It keys with *C. murrayi* but is more slender, has more annules and the vulva is more anteriad. *Ogma coronatum*, *O. lentiforme*, *O. tripius*, *O. tricodon* and *O. zernovi* are transferred to *Criconema* as new combinations. R.T.L.

(136l) An unidentified microfilaria occurred in 62 out of 200 magpies in Northern Colorado. R.T.L.

(136m) Two new nematodes, present in the rain retained by the folded leaves of *Quesnelia arvensis* as a water reserve, are figured, viz., *Butlerius gerlachi* n.sp., is nearly related to *B. butleri* but is more slender, the cuticle has longitudinal striations, the vulva is in the middle of the body, the tail in both sexes is shorter, the eggs are longer and the gubernaculum is different in shape. *Dorylaimus lordelloi* n.sp. is most nearly related to *D. intervallis* but is much more slender and longer, the lips are continuous with the neck contour, the spear is 1¼ lip widths, the prerectum of the female is 9–10 anal body diameters, the male has 7–9 supplements and 5–6 subventral papillae. R.T.L.

(136n) The chemical 3,5-dimethyl-4-chlorophenol was previously reported by Martin [*Amer. J. vet. Res.*, **11**, 58–69, see Helm. Abs., **19**, No. 3b] as a promising vermifuge for dogs. He now gives details of further tests which indicate that 0·19 0·29 per lb. body-weight of this compound is effective against ascarids. Histopathological studies gave no evidence of toxicity. R.T.L.

136—Proceedings of the Helminthological Society of Washington (cont.)

o. TINER, J. D. & RANGASWAMI, G., 1957.—" Effect of mycothricin complex on the nematode, *Rhabditis briggsae*." **24** (1), 70–71.
p. PITT, C. E. & GRUNDMANN, A. W., 1957.—" A study into the effects of parasitism on the growth of the yellow perch produced by the larvae of *Ligula intestinalis* (Linnaeus, 1758) Gmelin 1790." **24** (2), 73–80.
q. CHITWOOD, B. G. & BIRCHFIELD, W., 1957.—" A new genus, *Hemicriconemoides* (Criconematidae: Tylenchina)." **24** (2), 80–86.
r. DUNAGAN, T. T., 1957.—" Larval trematodes (Gorgoderidae) from Central Texas." **24** (2), 87–93.

(136o) Tiner & Rangaswami tested two preparations (complex A and complex B) of mycothricin, an antibiotic obtained from strains of the *Streptomyces lavendulae* group, against *Rhabditis briggsae*. Both inhibited growth of the larvae at 100 and 10 μgm. per ml. and the nematodes were killed in five days. Treatment with 1 μgm. per ml. resulted in two-fold or better increases in the nematode populations. Streptothricin and pleocidin, two related antibiotics, were also found to inhibit the nematode at concentrations of 100 and 10 μgm. per ml. S.W.

(136p) Data are presented which indicate that plerocercoid larvae of *Ligula intestinalis* produce a marked stunting effect in yellow perch. The incidence of infection increases with age. Infected fish possess little ability to encyst or destroy the plerocercoids and remain parasitized throughout their lives. R.T.L.

(136q) Chitwood & Birchfield describe *Hemicriconemoides* n.g., with three new species, *H. wessoni* n.sp., *H. biformis* n.sp. and *H. floridensis* n.sp., and bring into the new genus three species of *Criconemoides*, viz., *H. brachyurus* (Loos, 1949) n.comb., *H. cocophilus* (Loos, 1949) n.comb. and *H. gaddi* (Loos, 1949) n.comb. In *Hemicriconemoides* the females have a sheath with plain annules, usually fewer in number than in *Hemicycliophora*. The males have no sheath and no distinct stylet: they have lateral and sublateral ridges throughout their length giving the appearance of slight caudal alae but not well developed as in *Hemicycliophora*. The spicules are elongate, arcuate to straight. *H. wessoni* n.sp. is the type of the new genus: the sheath has 76–83 annules, 4–5 μ wide, which are flattened but not retrorse: the sheath does not always include the tail tip which is narrow conoid, while the sheath tip is broadly conoid. The stylet is 54 μ and the dorsal gland orifice 9 μ behind its base. The intestine extends anteriorly on the dorsal side of the base of the oesophagus for a short distance. The anus is at about the 5th annule from the tail tip and the vulva at about the 9th. *H. biformis* n.sp. is represented by two females only. They are similar except for the tail and are described separately. There are about 200 sheath annules, about 5 μ wide, somewhat flattened in the centre. The stylet is 110 μ long, the tip 93 μ and the base 17 μ. The tail in one specimen is conoid and attenuated, in the other bluntly rounded. *H. floridensis* n.sp. (syn. *Procriconema* sp. Steiner, 1949) also has about 200 sheath annules about 5–6 μ wide and flattened. There is a post-vulval fold of the sheath about 25 μ long. The tail tip is short, conoid and offset. The stylet is 115 μ long, the tip 87–97 μ and the base 20–25 μ. The dorsal gland orifice is 8 μ behind its base. The intestine extends dorsally forward over the oesophagus base as far as the posterior edge of the median bulb. No male is known. The authors give a key to the six species of *Hemicriconemoides*. M.T.F.

(136r) Two macrocercariae, viz., *Cercaria rabbi* n.sp. and *C. ruddi* n.sp. are described from *Musculium transversum*, collected in Brazos County, Texas, and are included in a check list key to the 16 species of macrocercariae now known. 24 figures on two plates illustrate their stylets. R.T.L.

136—Proceedings of the Helminthological Society of Washington (cont.)

s. VOGE, M., 1957.—" Notes on *Hymenolepis jacobsoni* von Linstow (Cestoda: Cyclophyllidea) from a shrew in India." **24** (2), 94.
t. ALLEN, M. W., 1957.—" A new species of the genus *Dolichodorus* from California (Nematoda: Tylenchida)." **24** (2), 95–98.
u. MEADE-THOMAS, G. & RISER, N. W., 1957.—" Observations on the morphology and systematic position of *Thysanocephalum thysanocephalum* (Linton 1889)." **24** (2), 98–106.
v. CHENG, T. C., 1957.—" A study of the metacercaria of *Crepidostomum cornutum* (Osborn, 1903), (Trematoda: Allocreadiidae)." **24** (2), 107–109.
w. KUNTZ, R. E., 1957.—" Experimental studies on the biology of *Heterophyes aequalis* Looss, 1902, in Egypt." **24** (2), 110–116.
x. DIKMANS, G., 1957.—" A note on the specific identity of *Protostrongylus frosti* Honess, 1942." **24** (2), 116–120.

(136s) Voge gives an illustration of a mature proglottis of *Hymenolepis jacobsoni* from *Suncus coeruleus* caught in Bombay. The excretory system has two pairs of longitudinal ducts, not one as originally described. Hübscher, in 1937, listed 11 rostellar hooks but Voge found 10 only in her specimens. R.T.L.

(136t) *Dolichodorus obtusus* n.sp. is described and figured. It is distinguished from the type *D. heterocephalus* by the shape of the lip region, the rounded female tail, the smoothly rounded end of the male bursa and the presence of four incisures instead of three on each lateral field. The diagnosis of the genus is emended. Many individuals were parasitized by a unicellular organism which is figured but not named. J.B.G.

(136u) Meade-Thomas & Riser give a detailed description of the nervous system and of the main ganglionic mass in *Thysanocephalum thysanocephalum* from the tiger shark *Galeocerdo arcticus* and discuss its systematic position. As the genus cannot be placed in any of the families of Phyllobothrioidea, owing to the loculation and armature of the phyllidia, Thysanocephalidae n.fam. is made for its reception. R.T.L.

(136v) Almost 100% of the crayfish *Cambarus bartoni sciotensis* in Sinking Creek, Giles County, Virginia, are infected with the metacercariae of *Crepidostomum cornutum*. The metacercaria, which is figured, is progenetic and differs from the adult in minor characters only; the eggs are non-fertile, the vitellaria are less developed and the excretory vesicle is extremely large. R.T.L.

(136w) Over 98% of several thousand *Pirenella conica* from the brackish Lake Burullus in Egypt were found to be infected with one or more species of heterophyid cercariae. The viability and longevity of cercariae when lake water was diluted with pond water was not drastically affected until after six to eight hours, although movements became sluggish after five hours. In equal parts of brackish and fresh water the aggressiveness of *Heterophyes aequalis* to *Gambusia*, *Tilapia* and *Barbus*, showed no reduction. Although these three fishes became infected a considerable number of the encysted cercariae from *Tilapia* and *Barbus* were non-viable. Those from *Barbus* failed to become adult in kittens. Laboratory rats and mice proved poor definitive hosts whereas cats and dogs were excellent hosts. R.T.L.

(136x) Dikmans figures the gubernaculum of the type specimen of *Protostrongylus frosti* and considers that the shape and size of its flanges permit its ready differentiation from other species of the genus. The key by Skryabin *et al.* (1952) to the four subgenera of *Protostrongylus*, based mainly on the conformation of the crura of the gubernaculum, is reproduced (in translation). *P. frosti* does not fit into any of these subgenera but as the erection of a new subgenus seems unjustified owing to the paucity and condition of the present material it is left in *Protostrongylus* sensu lato. R.T.L.

136—Proceedings of the Helminthological Society of Washington (cont.)

y. LUTTERMOSER, G. W. & BOND, H. W., 1957.—" Anthelmintic activity of the fruits of *Diospyros mollis* (Maklua) and tests for activity of other persimmons." **24** (2), 121–124.
z. HWANG, J. C. & WEHR, E. E., 1957.—" *Thelazia platyptera* n.sp. (Nematoda: Thelaziidae) from the eye of the broad-winged hawk, *Buteo platypterus* (Vieillot, 1823)." **24** (2), 125–127.
ba. RAUSCH, R. & YAMASHITA, J., 1957.—" The occurrence of *Echinococcus multilocularis* Leuckart, 1863, in Japan." **24** (2), 128–133.
bb. KELLEY, Jr., G. W., OLSEN, L. S. & HOERLEIN, A. B., 1957.—" Rate of migration and growth of larval *Ascaris suum* in baby pigs." **24** (2), 133–136.
bc. SCHNEIDER, M. D. & RADKE, M. G., 1957.—" Further observations on a complement-fixing substance from *Schistosoma mansoni*." **24** (2), 137–139.
bd. HERLICH, H., 1957.—" Preliminary observations on calves experimentally infected with *Trichostrongylus colubriformis*." **24** (2), 139–140.
be. SENGER, C. M. & BATES, J. W., 1957.—" The occurrence of *Hymenolepis evaginata* and *H. ondatrae* in Utah muskrats." **24** (2), 141–142.

(136y) As fresh green fruit of the tree *Diospyros mollis* had been reported by Sadun & Vagrasthira (1954) to be very effective against hookworms in man and the dog, critical tests were made with the fruits of several persimmons. The pulp of fresh berries of *D. mollis* proved active against *Toxocara canis* and *Ancylostoma caninum* but inactive against *Schistosoma mansoni* and *Hymenolepis nana* in mice. Preliminary results from tests with shikimic acid showed some activity against *Trichuris vulpis*, but five higher esters of gallic acid were inactive against intestinal helminths of the dog or *Schistosoma mansoni* in mice although the lower esters have been found by Japanese workers to have anthelmintic properties. R.T.L.

(136z) *Thelazia platyptera* n.sp. from the eyes of *Buteo platypterus* caught at Tifton, Georgia, U.S.A. is figured and differentiated from *T. chui*, the most obvious difference being the relatively greater length of the left spicule which in *T. platyptera* measures 2·68–2·69 μ and in *T. chui* 2·07 μ. R.T.L.

(136ba) Alveolar hydatid disease is common among the inhabitants of the Japanese island of Rebun. Evidence is submitted that the infection is *Echinococcus multilocularis* not *E. granulosus* to which it has been attributed by Japanese workers. Of the indigenous mammals the red-backed vole *Clethrionomys rufocanus* is probably the intermediate host. The authors have identified two adult *E. multilocularis* in a Rebun dog and Ambo *et al.* found one out of 57 cats infected in 1953. R.T.L.

(136bb) Piglets removed from the uteri of sows were given suspensions of *Ascaris suum* eggs when they were two days old. Larvae were abundant in the liver in two days and almost all had reached the liver by the fourth day. A few reached the lungs on the second day, the majority on the sixth day and almost all by the ninth day. They were first found in the small intestine on the eighth day and almost all had migrated to the small intestine by the 13th to 15th day. The measurements of the larvae on successive days are larger than in those from rabbits, guinea-pigs and mice. R.T.L.

(136bc) A fractionation technique is detailed by which a non-dialysable substance containing a relatively heat stable complement-fixing antigen, which reacts with sera from individuals with *Schistosoma mansoni* eggs in their faeces, can be obtained from dried *S. mansoni* but its evaluation in clinical diagnosis awaits further purification of the active moiety. R.T.L.

(136bd) Experimental evidence is produced, for the first time, that *Trichostrongylus colubriformis* has a detrimental effect on calves. Doses of 250,000 and over proved fatal to calves, four months old, following the development of anorexia and persistent diarrhoea. The only gross lesions were slight congestion and duodenal catarrh. R.T.L.

(136be) Colorado is the western limit of the geographical distribution of *Hymenolepis evaginata* in the United States so far reported. It has now been found in 21 musk-rats, *Ondatra zibethica osoyoosensis* trapped in the Cache Valley area of northern Utah and in one musk-rat

from Bozeman, Montana. A few specimens of *H. ondatrae* were also present in three of the animals. This extends its range eastwards into the Great Salt Lake drainage area. Coenuri of *Taenia mustelae*, *Echinostoma revolutum* and *Quinqueserialis quinqueserialis* were also collected from musk-rats in northern Utah. R.T.L.

137—Queensland Agricultural Journal.

a. STEVENS, M. S., 1957.—" Hookworm infestation of working dogs." **83** (1), 31–33.
b. MOULE, G. R., 1957.—" The occurrence and control of worm parasites of sheep in Queensland." **83** (1), 41–46; (2), 83–90; (3), 143–146.
c. COLBRAN, R. C., 1957.—" The strawberry root-knot nematode." **83** (5), 256–258.

(137a) As *Ancylostoma caninum* is a serious infection in working dogs in the western areas of Queensland, the clinical symptoms, life-history, treatment and prevention are summarized. R.T.L.

(137b) This is a continuation of Moule's article in the December issue of the Queensland Agricultural Journal and deals with the relation of worm parasites of sheep in Queensland to the weather and the danger of overstocking. In the far west of Queensland, which is usually worm-free, cloudy weather with light falls of rain and local overstocking are responsible for the occurrence of *Haemonchus contortus* infections. Under drought conditions places where there are shelter and moisture are dangerous. Watering places, feeding grounds, feeding troughs and camps also are actual or potential danger spots. As sheep may carry over an infestation into a dry period it is advisable to drench them. Dryness at this time will destroy the eggs or larvae on the pastures. R.T.L.

(137c) As *Meloidogyne hapla* is now present in the majority of strawberry plantings in Queensland the planting of clean runners is most important. The percentage of these from infested plants can be increased by mulching, to a depth of four inches between the rows, with borax-free sawdust or stable manure. Alternatively, the inter-rows can be treated with EDB (12½% v/v) at the rate of 20–25 gallons per acre 10 to 14 days before planting. For heavily infested areas crop rotation with Sudan grass, panicum, oats, wheat and *Crotalaria* spp. is recommended. R.T.L.

138—Revista Brasileira de Biologia.

a. BARBOSA, F. S. & CARNEIRO, E., 1957.—" The hybrids *glabratus* x *boissyi*, with a discussion on the position of the genera *Australorbis* and *Biomphalaria* (Mollusca, Planorbidae)." **17** (1), 43–49.
b. RUIZ, J. M., 1957.—" Esquistossomose experimental. 5. Dados sôbre a infestação experimental de *Biomphalaria tenagophila* (Orbigny) e *Australorbis glabratus* (Say)." **17** (2), 179–185.
c. FREITAS, J. F. TEIXEIRA DE & DOBBIN, Jr., J. E., 1957.—" Novo nematódeo parasito de *Rana palmipes* Spix: *Subulascaris falcaustriformis* g.n., sp.n. (Nematoda, Ascaridiformes)." **17** (2), 245–248.

(138a) When the schistosome vector *Biomphalaria boissyi*, from Egypt, was crossed with albino laboratory stock of *Australorbis glabratus*, from Brazil, fertile hybrids were produced. The first and second generations showed characteristics of both species. Commenting on the fact that *Biomphalaria* and *Australorbis* seem to be congeneric, Barbosa & Carneiro recommend that no nomenclatural changes be made until the anatomy of planorbids from different regions, and the position of the genus *Taphius*, are thoroughly understood. M.McK.

(138b) Ruiz established infections of *Schistosoma mansoni* in laboratory descendants of *Australorbis glabratus* from three out of four areas in South America. He failed to infect *Biomphalaria straminea* (= *Tropicorbis centimetralis*) and several dozen *B. tenagophila* (= *Australorbis nigricans*). The last species had been obtained from the coast of São Paulo State, where it is a vector, and from the inland city of São Paulo where it is the predominant planorbid although no schistosome infections have been found there. M.McK.

(138c) *Subulascaris falcaustriformis* n.g., n.sp. from *Rana palmipes* in Brazil is characterized by a smooth and pliable inflation of cuticle around the cephalic end, a mouth with three lips and an oesophagus with muscular and glandular portions. The male has lateral but no caudal alae, one pre-anal papilla and pseudosucker and two post-anal pairs of papillae. The spicules are similar to those of *Falcaustra mascula*. The two ovaries are amphidelphic. The new genus is placed in Subulascarididae n.fam. in the Ascaridiformes. [No differential diagnosis is given.] M.MCK.

139—Revista Brasileira de Gastroenterologia.

a. COUTINHO, A. B., 1957.—" Patologia geral da esquistossomose." **9** (1), 5–18.
b. VASCONCELLOS, D., 1957.—" Ascaridiose do colédoco." **9** (1), 19–24.

(139a) This lecture by Coutinho is a general discussion on host-parasite relationships in schistosome infections, followed by answers to questions, in which he enlarges on the effect of dead schistosomes in the body and the consequent dangers of treatment. M.MCK.

140—Revista Brasileira de Medicina.

a. RIBEIRO, H. DE P., 1957.—" Anemia e parasitoses intestinais." **14** (1), 14–16. [English summary p. 16.]

(140a) At the Women's Hospital of Santa Casa in Juiz de Fora, Brazil, intestinal parasitic diseases stand out among the ills for which patients are interned. Of 1,034 admitted from 1950 to 1954 *Ancylostoma* was found by direct faecal examination in 47%, *Ascaris* in 35%, *Trichuris* in 21%, *Strongyloides* in 6% and tapeworm in 0·7%. M.MCK.

141—Revue de l'Agriculture. Brussels.

a. LATTEUR, J. P., 1957.—" Verminoses. Infestation des herbages et méthodes de prophylaxie." **10** (2), 169–218. [English & German summaries p. 218.]

(141a) Latteur outlines the subject of helminth parasitism with particular emphasis on its importance in lowering food production throughout the world. R.T.L.

142—Revue de Médecine Vétérinaire.

a. EUZÉBY, J., 1957.—" Le téniasis des ruminants et son traitement." **108**, 178–184.

(142a) Euzéby gives a general account of cestodes in ruminants, particularly of *Moniezia expansa* which is the most pathogenic. He discusses its distribution in France, epidemiology, life-history, pathogenicity, diagnosis and prognosis, lists the anthelmintics in use against it and outlines prophylactic measures. S.W.

143—Rivista di Parassitologia.

a. MAFFI, M., 1957.—" Malacofauna e schistosomiasi nel Medio e Basso Giuba, alla luce di vecchi e nuovi elementi di giudizio." **18** (2), 69–76. [English summary p. 76.]
b. ZAVATTARI, E., 1957.—" Ancora: malacofauna e schistosomiasi nel Medio e Basso Giuba." **18** (2), 77–90. [English summary p. 90.]

(143a) In this critical discussion of Zavattari's paper on molluscs and urinary schistosomiasis along the middle and lower Juba [see Helm. Abs., **25**, No. 290a], Maffi quotes data from papers which Zavattari had omitted to mention and stresses that Pellegrini, in 1953, was the first to report a *Physopsis* in the area. He suggests that experiments are necessary before stating that *Physopsis* is the local vector and considers that Zavattari assumed without justification that his molluscs (identified for him by Piersanti as *P. soleilleti*) were *P. globosa*. In any case, identification should not be based on shells alone. Other statements by Zavattari are queried or discussed. Maffi points out that neither competent authors nor health officials have stressed that *Schistosoma haematobium* is preponderant among older children in the lower and middle Juba region. M.MCK.

(143b) In his reply to the criticisms of Maffi [see abstract No. 143a above] Zavattari considers that the papers he omitted were irrelevant and that he is the first to have found hundreds of *Physopsis* in many places along the middle and lower Juba. His identification of *P. globosa* was only tentative. M.MCK.

144—Sborník Vysoké Školy Zemědělské a Lesnické v Brně. Rada B. Spisy Fakulty Veterinární.

a. DYK, V., 1957.—"Nález vrtejše *Echinorhynchus clavula* Dujardin 1845 a specifičnost našich rybích vrtejšů." [The finding of the acanthocephalan *Echinorhynchus clavula* Dujardin, 1845 and the specificity of our fish Acanthocephala.] **5** (1), 87–93. [German & Russian summaries pp. 92–93.]

(144a) Dyk reports the finding of *Echinorhynchus clavula* in *Salmo trutta* morpha *fario* from the river Punkva near Brno, thus raising the number of acanthocephalan species known from fish in waters of Moravia-Silesia to five (seven are known in Slovakia). He attempts to classify these acanthocephalans into three groups according to their host specificity. The only truly specific species is *E. truttae*, while the most adaptive is *Neoechinorhynchus rutili*. G.I.P.

145—Seed Trade Review. London.

a. BROWN, E. B., 1957.—"The occurrence of lucerne stem eelworm in Great Britain with special reference to the origin of the attacks." **9** (1), 30–34.

(145a) So far as is known the race of stem eelworm in lucerne will only attack lucerne, alsike clover, sweet clover and possibly a few weeds. Red clover has often been seen growing in patches affected by lucerne stem eelworm and healthy crops of oats have followed the ploughing up of infested lucerne. Symptoms do not appear in lucerne until the spring following drilling. Some recovery occurs in dry periods. On sloping land a long narrow patch may quickly develop from a small initial patch owing to the worms being washed down by surface drainage. Severe infestations may have to be ploughed up after only 2 to 3 years. Recent infestations seen in the Eastern Counties of England have occured in French varieties. The incidence in Provence appears to be much lower than in some other varieties. As the infection is seed-borne its spread to other fields could be prevented if all seed were fumigated with methyl bromide. R.T.L.

146—Shikoku Acta Medica.

a. MURAKAMI, K., 1957.—[Studies on *Clonorchis sinensis*. Surveys on the infection of encysted larvae of *Clonorchis sinensis* in fresh-water fish (*Pseudorasbora parva*) in Tokushima Prefecture.] **10** (1), 11–31. [In Japanese: English summary pp. 11–12.]

(146a) From an examination of 1,801 *Pseudorasbora parva* for encysted larvae of *Clonorchis sinensis* it is estimated that Tokushima Prefecture is one of the most heavily infected regions in Japan. In Naruto City in the district of Ohtsu-cho 93·3%, at Kitajima-cho, Itano-gun 70·7% and at Horie-cho, Itano-gun 50·3% of the fish examined contained the metacercariae. *Pseudorasbora parva* is now believed to be the most important second intermediary of *C. sinensis* in Japan. It is also the vector of 12 other trematode species. These are listed. R.T.L.

147—South African Medical Journal.

a. LURIE, H. I. & DE MEILLON, B., 1957.—"Experimental bilharziasis in laboratory animals. V. Immunity in mice produced by repeated small infections." **31** (4), 68–69.
b. DE MEILLON, B. & PATERSON, S., 1957.—"Experimental bilharziasis in animals. VI. Effect of bilharziasis on growth, reproduction and longevity in white mice." **31** (12), 281–282.
c. LUNTZ, M. H., 1957.—"Hydatid cyst of the orbit demonstrated by pneumatomography." **31** (12), 286–287.
d. POLITZER, W. M. & BEUCHAT, A., 1957.—"Urinary lithiasis in an African." **31** (13), 311–312.

(147a) After single intraperitoneal injections of 50–250 cercariae of *Schistosoma mansoni* into white mice, 23·5% of the larvae developed into adults. Only 1·5% reached maturity

after repeated weekly infections with 10 or 29 cercariae per injection and a total of 100–760 larvae per mouse. The pathological changes observed up to 48 weeks after initial infection are tabulated in detail. 20–24 weeks after the first of a series of infections the pathological picture corresponded with that seen eight weeks after single infections, but from the 24th to 38th week there was no significant difference between the two groups. There was a tendency to spontaneous cure 40–48 weeks after a single infection. M.MCK.

(147b) In colonies of white mice experimentally infected with *Schistosoma mansoni* the normal increment in weight and the weaning rate decreased while the mortality rate increased. But the size of the litters and their weight at birth and weaning were unaffected. An initial dose of 50 cercariae gave some protection against a subsequent dose of 250 cercariae. In monkeys a lethal dose of cercariae could be given in divided doses over an extended period without risk. It is suggested that the administration of chemotherapeutic drugs to populations constantly under risk of infection merits investigation. R.T.L.

(147d) Urinary lithiasis is comparatively rare in the African and much less frequent in the South African Bantu than in Africans living in Southern Rhodesia. In the case now reported the stones were so large that they impeded defaecation. Repeated examination of the urine and faeces for eggs of *Schistosoma haematobium* were negative. R.T.L.

148—Tidsskrift for den Norske Laegeforening.

a. NESE, G., 1957.—" Echinokokkcyster i lungene." **77** (3), 103–106. [English summary p. 106.]

149—Transactions of the American Microscopical Society.

a. WOODHEAD, A. E., 1957.—" Germ-cell development in the first and second generations of *Schistosomatium douthitti* (Cort, 1914) Price, 1931 (Trematoda: Schistosomatidae)." **76** (2), 173–176.
b. SCHELL, S. C., 1957.—" Dicrocoeliidae from birds in the Pacific Northwest." **76** (2), 184–188.
c. OLSEN, L. S., 1957.—" A new species of *Neoascaris* (Nematoda) from a Korean wood mouse." **76** (2), 205–208.
d. KUNTZ, R. E., 1957.—" Development of the cercariae of *Fasciola gigantica* Cobbold 1855, with emphasis on the excretory system." **76** (3), 269–274.
e. DUNAGAN, T. T., 1957.—" Helminth parasites of Alaskan muskrats." **76** (3), 318–320.
f. ULMER, M. J., 1957.—" Notes on the development of *Cotylurus flabelliformis* tetracotyles in the second intermediate host (Trematoda: Strigeidae)." **76** (3), 321–327.
g. TAYLOR, E. L. & PARFITT, J. W., 1957.—" Mouse test for the infectivity of metacercariae with particular reference to metacercariae in snail faeces." **76** (3), 327–328.
h. FRANDSEN, J. C., 1957.—" *Phyllodistomum bufonis* sp.nov. (Trematoda: Gorgoderidae) from the urinary bladder of the western toad, *Bufo boreas* Baird & Girard, 1852." **76** (3), 329–332.

(149b) Four new species of Dicrocoeliidae are described from Idaho, viz., (i) *Concinnum burleighi* n.sp. from the bile-ducts of the fox sparrow, *Passerella iliaca*. It differs from *C. ludovicianae* in having a larger ovary, smaller eggs and a longer body with a tapering pointed end. (ii) *Brachylecithum idahoensis* n.sp. from the bile-ducts of a sparrow hawk, *Falco sparverius*, resembles *B. stunkardi* but has larger testes, smaller eggs, a circular acetabulum without lateral projections. The distance between the anterior testis and acetabulum is less than one half the length of the testis and the acetabulum's transverse diameter less than the body width. (iii) *Athesmia jolliei* n.sp. from the bile-ducts of the sparrow hawk, *Falco sparverius*, is distinguished from the other species of this genus by the extension of the acetabulum across two-thirds to three-fourths of the body which is approximately half the length and width of other species. The testes are only slightly lobed. (iv) *Paradistomum passerculum* n.sp. from the bile-ducts of the western savannah sparrow, *Passerculus sandwichensis alaudinus*, closely resembling *P. samoensis*. It differs in having sinuous caeca, which extend through two-thirds of the body length, and a distinctly larger cirrus pouch. The body is 3·8–4·3 mm. long. *Brachylecithum mosquensis* Skrjabin & Isaitschikoff, 1927 is now recorded from North America and is reported for the first time in *Turdus migratorius* and *Ixoreus n. naevius*, while *Lutztrema monenteron* Price & McIntosh, 1935 is a new record for *Ixoreus n. naevius* and *Pipilo maculatus oregonus*. R.T.L.

(149c) *Neoascaris apodemi* n.sp., collected from the small intestine of the wood mouse *Apodemus peninsulae* in Korea, differs from *N. vitulorum* in the smaller size of the body (35·5 mm. in the male and 95 mm. in the female), the shorter spicules (0·45–0·54 mm.) and the presence of muscle fibres instead of a granular tissue in the oesophageal bulb. Olsen mentions that specimens of *Kalicephalus natricis* were found in a *Natrix tigrina* taken at Chip'or-ri in Korea. R.T.L.

(149d) Kuntz describes the early cercarial development of *Fasciola gigantica*, in Egypt, and provides freehand diagrammatic drawings based on living specimens. Save for minor differences it parallels very closely that of *Fasciola hepatica* reported by him in 1951. R.T.L.

(149e) Dunagan summarizes earlier records of the helminth parasites of musk-rats and tables five Trematoda, two Cestoda, one Nematoda and one Acanthocephala species, with percentages of their incidence at Fork Yukon, Selawik, Minto and Tetlin Lakes in Alaska. R.T.L.

(149f) Laboratory-reared *Limnaea reflexa* were infected with eggs of *Cotylurus flabelliformis* and resulting cercariae were used to infect further specimens of *L. reflexa* with metacercariae. The development of the metacercarial stage in these second intermediate hosts was strikingly unusual. The size of infecting cercariae increased immensely and almost all the internal organs were broken down. This was followed by a reorganization of the body which resulted in the production of the features characteristic of a typical tetracotyle within a transparent cyst wall. Camera lucida drawings illustrate the developing forms, pre-cysts and encysted tetracotyles. R.T.L.

(149g) Although a single *Fasciola hepatica* is fatal to mice and none survive infection for more than six weeks, these laboratory animals are very useful for testing the infectivity of metacercariae. Three weeks after the metacercariae, suspended in gum mucilage, have been administered by pipette, the parasites can quickly and with certainty be found in the liver or peritoneal cavity. Using this technique the authors also demonstrated the viability of *Fasciola hepatica* cysts which appeared in the faeces of *Limnaea truncatula* kept in glass vessels containing snails shedding cercariae. The metacercariae, encysted on the glass walls, had apparently been eaten along with algae. R.T.L.

(149h) *Phyllodistomum bufonis* n.sp. occurred in *Bufo boreas* from Silver Lake, Salt Lake County, Utah. It is the largest species of the genus measuring 7·5 to 9 mm. in length and 2 to 2·75 mm. in breadth. There is no posterior notch. The testes are irregularly lobed, the ootype and the coiled metraterm lie anterior to the vitellaria which are divided into three to nine deep finger-like lobes. The ovary is irregularly lobed but not as deeply as the testes. The sucker lacks papilla-like structures and the ratio of sucker to acetabulum is 1:1·73 to 1:2. R.T.L.

150—Transactions of the Royal Society of South Australia.

a. EDMONDS, S. J., 1957.—" Australian Acanthocephala No. 10." **80**, 76–80.
b. MAWSON, P. M., 1957.—" Marine freeliving nematodes from South Australia. Part 1." **80**, 98–108.
c. CLARK, H. G., 1957.—" Cestodes from cormorants from South Australia." **80**, 124–134.
d. MAWSON, P. M., 1957.—" Some nematodes from fish from Heron Island, Queensland." **80**, 177–179.

(150a) *Pseudoporrorchis hydromuris* n.sp. from the Australian water-rat, *Hydromys chrysogaster*, in Queensland, is very similar to *P. hylae* but the introvert is globose or subspherical and slightly smaller. The hooks in each longitudinal row number only 7 to 8, while the posterior end of the female is bulb-like and bears a small appendix. *P. bulbocaudatus*, *P. centropusi* and *Gordiorhynchus hylae* are considered to be synonymous with *P. hylae*. *Bolbosoma capitatum* is recorded from a *Globiocephalus melaena* stranded at Prime's Beach, St. Vincent Gulf, South Australia. An acanthocephalan from *Canis familiaris dingo* from Central Australia is identified as *Oncicola* sp. Banks, 1952. R.T.L.

(150b) *Metoncholaimus brevispiculum* n.sp. from jetty piles at Brighton, in St. Vincent's Gulf, is distinguished from other species of the genus by the shortness of the straight tapering spicules which are 40–45 μ long and only a little over the anal breadth. A key to 9 species of *Steineria* includes *S. pulchra* n.sp. from weeds on a jetty pile, Outer Harbour, St. Vincent's Gulf, and among holdfasts of *Hormosira* sp. and *Ulva* sp., Encounter Bay. *S. pulchra* is closest to *S. horrida* differing only in several small features, but as only females of *S. horrida* are known, complete comparison is not yet possible. [A foot-note mentions that Wieser (1953) excluded *S. horrida* and *S. mirabilis* which appear in the key.] Accounts are given of *Anticoma similis* and *Prooncholaimus megastoma*, *Polygastrophora hexabulba*, *Halichoanolaimus robustus*, *H. ovalis* and *Spiliphera dolichura* from the South Australian littoral. R.T.L.

(150c) *Paradilepis* sp., *P. minima*, *P. scolecina*, *Dilepis maxima*, *Hymenolepis cormoranti* and *H. phalacrocorax* are redescribed and figured from cormorants in South Australia. Examination of the slides of *Dilepis minima* Goss, 1940 reveals that the material contained two species one of which is now identified as *Paradilepis scolecina* (Rud.) and the name *D. minima* is restricted to the specimens with the larger hooks, and transferred to *Paradilepis* as *P. minima* n.comb. R.T.L.

(150d) Ascarids, enclosed in a loose outer sheath and presumably in the third larval stage, are identified as *Thynnascaris* sp. from the tusk fish *Chaetodon* sp., and from *Cattydon* sp. Females of *Procamallanus* sp. from the black-spined bream, *Sigmanum nebulosus*, and *Metabronema magna* from the swim bladder of *Caranx speciosus* are recorded and figured. R.T.L.

151—Transactions of the Royal Society of Tropical Medicine and Hygiene.

a. FAWDRY, A. L., 1957.—" Onchocerciasis in South Arabia." **51** (3), 253–256.
b. RODGER, F. C. & BROWN, J. A. C., 1957.—" Assessment of the density of infection with onchocerciasis and the probable level of safety from its ocular complications." **51** (3), 271–282.
c. PAULINI, E. & PELLEGRINO, J., 1957.—" Influence of infection with *Schistosoma mansoni* on the susceptibility of *Australorbis glabratus* to copper sulphate." [Correspondence.] **51** (3), 283–284.
d. WEBBER, W. A. F., CRISP, G., WRIGHT, A. I. & WILLIAMS, P., 1957.—" Records of *Onchocerca* found at postmortem examination of Welsh cattle." [Demonstration.] **51** (4), 295.
e. KERSHAW, W. E. & WILLIAMS, P., 1957.—" Survival of the vector of cotton-rat filariasis." [Demonstration.] **51** (4), 296.
f. NEWSOME, J., 1957.—" Storage of live schistosome eggs." [Demonstration.] **51** (4), 299–300.
g. ROBINSON, D. L. H., 1957.—" *S. mansoni* schistosomulae in vitro." [Demonstration.] **51** (4), 300.
h. BERG, E., 1957.—" Effects of castration and testosterone in male mice on *Schistosoma mansoni*." **51** (4), 353–358.
i. EDESON, J. F. B., HAWKING, F. & SYMES, C. B., 1957.—" The periodicity of microfilariae. VI. The response of microfilariae of *Wuchereria malayi* and *W. bancrofti*, Pacific type, to various stimuli." **51** (4), 359–365.
j. EDESON, J. F. B. & WHARTON, R. H., 1957.—" The transmission of *Wuchereria malayi* from man to the domestic cat." **51** (4), 366–370.
k. NEWSOME, J., 1957.—"Test of cure in schistosomiasis." [Correspondence.] **51** (4), 372–373.

(151a) The occurrence of onchocerciasis in the Yemen is reported for the first time. The 50 cases seen suffered from an itching dermatitis chiefly of the leg. Although sections of the skin showed only a few microfilariae there was great thickening of the dermis and the lymph nodes were infiltrated by large numbers of eosinophils. *Onchocerca volvulus* adults were found in a subcutaneous tumour removed from the groin of one patient. R.T.L.

(151b) Although a single positive biopsy suffices to establish the presence of *Onchocerca* infection, statistical studies on 3,000 cases showed that a 4-skin biopsy series, repeated once where negative, is the minimum needed for accuracy. Two methods of assessing the degree of infection are described, viz., (i) Individual Density based on the known anatomical distribution of the microfilariae and not on microfilarial counts and (ii) Density Quotient for assessing the density of infection in a community. By these methods the level of infection at which there is no risk of blindness is measurable and should be taken as a guide to therapeutic and control measures. R.T.L.

(151c) When *Australorbis glabratus*, infected with *Schistosoma mansoni*, were in flowing water to which copper sulphate was applied at the rate of 15 to 20 parts per million, the mortality was 42·5% after half-an-hour, 66·6% after one hour, 87·5% after two hours and 100% after four hours. In non-infected snails submitted to the same conditions the mortality was 25% after half-an-hour, 29·5% after one hour, 52·5% after two hours and 75% after four hours. Infected and non-infected snails kept as controls showed no mortality. The results are in close agreement with those obtained with sodium pentachlorophenate. R.T.L.

(151d) The incidence of *Onchocerca* adults and/or microfilariae in cattle slaughtered at Wrexham abattoir was about 25% in those from Ireland and 60% in those from Wales and Cheshire. Adult worms occurred in the omentum of 31 out of 263 and in the nuchal connective tissue in 44 out of 249. Microfilariae were present in the skin of 53 out of 164 animals examined. R.T.L.

(151f) The eggs of *Schistosoma mansoni* from the gut of a hyperinfected baboon survived well at 5°C. in Tyrode's solution, distilled water and a thick faeces-water emulsion. The best preparations gave good circumoval precipitates with positive sera after six weeks' storage, but died within eight weeks. Those obtained from the gut or liver of hamsters or rats could not be stored for more than three weeks. The addition of penicillin reduced contamination and did not shorten survival. R.T.L.

(151g) Robinson describes a technique whereby schistosomulae of *Schistosoma mansoni* were obtained from hamsters eleven days after infection. They were maintained for 58 days in horse serum diluted with two parts of Tyrode's solution to which 0·2% of glucose was added. Few had increased more than double in size whereas they should have become fully grown. R.T.L.

(151h) When male mice previously infected with *Schistosoma mansoni* were castrated there was a significant decrease in the number of male schistosomes which developed. After subcutaneous inoculation of aqueous testosterone suspension the number of male and female worms was reduced. In uncastrated mice the effect of testosterone reduced both sexes in number. R.T.L.

(151i) A detailed study of the effects of oxygen, increased carbon dioxide, hyperventilation and exercise on the microfilarial count of *Wuchereria malayi* during the day and at night and on that of the non-periodic *Wuchereria bancrofti* of the Pacific revealed that the numbers of microfilariae of *W. malayi* fell with increased oxygen and with muscular exercise whereas those of the Pacific *W. bancrofti* rose slightly. R.T.L.

(151j) Edeson & Wharton give a preliminary account of the first successful transmission of *Wuchereria malayi* from man to the domestic cat by inoculation with infective larvae obtained from laboratory-bred *Mansonia uniformis* which had been fed on a human carrier. The prepatent period in the cats ranged from 80 to 96 days. The microfilariae, infective larvae and adults obtained from the cats were indistinguishable from those described from man. It is pointed out that these new facts make the interpretation of natural infection rates in mosquitoes almost impossible and introduce new epidemiological problems. R.T.L.

(151k) Newsome points out that the criteria of cure in urinary schistosomiasis cases are to some extent dependent on the drug used and on the region in which it is used. Some antimony compounds weaken the miracidia which do not hatch. Hatching tests may be of limited help as tests for cure. Examinations of rectal scrapings after treatment with sodium antimony gluconate were useless as tests of cure in South Africa although valuable elsewhere. Statements on the validity of tests of cure "should say only that hatching tests, rectal biopsy, C.F. tests etc. were valuable or useless in assessing cure by a certain dose of a certain drug in a certain place". R.T.L.

152—Veterinaria. Sarajevo.

a. RUKAVINA, J., DŽUMUROV, N. & DELIĆ, S., 1957.—" Larve *Diphyllobothrium erinacei europaei* kod svinja." [Larvae of *Diphyllobothrium erinacei europaei* in pigs.] **6** (1), 46–55. [English summary p. 46.]

b. GALL, Z. & DELIĆ, S., 1957.—" Helminti crijevnog trakta pasa iz Sarajeva i bliže okoline." [Helminths of the intestinal tract of dogs from Sarajevo and its vicinity.] **6** (1), 175–178. [English summary p. 175.]

c. BOKO, F., SMRČEK, Z. & BELJIN, V., 1957.—" Hidatidni pneumotoraks izazvan rupturom ehinokokus ciste pluća sa ehinokokom u srčanoj pregradi krave." [A case of pneumothorax caused by the rupture of a hydatid cyst and a hydatid cyst in the ventricular septum of a cow.] **6** (1), 179–182. [English summary p. 179.]

d. RUKAVINA, J. & DELIĆ, S., 1957.—" Prilog poznavanju raširenosti *Azygia lucii* (Müller 1776 Lühe 1909) kod riba u BiH." [On the distribution of *Azygia lucii* (Müller 1776 Lühe 1909) in fish in Bosnia and Hercegovina.] **6** (2/3), 410–413. [English summary p. 410.]

e. RUKAVINA, J., 1957.—" Moniezioza kao problem našeg ovčarstva." [Monieziasis as a problem to our sheep farming.] **6** (2/3), 429–433. [English summary p. 429.]

f. DELIĆ, S. & BADNJEVIĆ, B., 1957.—"Jedan slučaj nalaza *Multiceps multiceps* Goeze (*Coenurus cerebralis* Rudolphi) kod divokoze (*Rupicapra rupicapra* L.)." [A case of *Multiceps multiceps* Goeze (*Coenurus cerebralis* Rudolphi) in the chamois (*Rupicapra rupicapra* L.).] **6** (2/3), 434–436. [English summary p. 434.]

g. BOKO, F., BELJIN, V. & GAVRANOVIĆ, I., 1957.—" Prilog ispitivanju brzine rasta hidatidnih cista u jetri svinje." [On the rate of growth of hydatid cysts in the liver of pigs.] **6** (2/3), 446–448. [English & French summaries pp. 446, 448.]

(152a) In 57·4% out of 47 pigs from Backi Monoštor in Yugoslavia plerocercoids of *Diphyllobothrium erinacei europaei* were found mainly under the fasciae of the muscles of the thigh and shoulder but not in the masseter, head, tongue and intercostal muscles. The larvae and the adults, the latter obtained by infecting a dog, are described. The authors found that the lateral zones, both of the testes and the vitellaria, may be joined anterior to the genital aperture or may be completely separate or only approach one another in different proglottides of the same worm. Thus, the statements by Brumpt and by Wardle & McLeod that this characteristic may be used for the differentiation of the species of *Diphyllobothrium* (*Spirometra*) are not confirmed. The existence of other foci in the Pannonian Plain is suspected. G.I.P.

(152b) The intestinal helminths most frequently encountered in 100 dogs from Sarajevo and its vicinity were *Trichuris vulpis* (52%), *Uncinaria stenocephala* (49%) and *Toxocara canis* (32%). *Taenia echinococcus* occurred in 12% of the dogs with a maximum intensity of 6,500 worms. A table compares the infections found with those reported by earlier authors for dogs in Yugoslavia. G.I.P.

(152c) Pneumothorax caused by the rupture of a hydatid cyst in the lung of a cow was diagnosed clinically. On autopsy a second cyst was found in the septum of the ventricles of the heart. G.I.P.

(152d) *Azygia lucii* was found only in *Hucho hucho* and *Thymallus thymallus* in the river Vrbas from among 739 Salmonidae and 111 Cyprinidae examined from 21 rivers, a fish pond and a lake in Bosnia and Hercegovina in Yugoslavia. The infections were light. The worms measured 1 to 10 mm. in length irrespective of the host but otherwise agreed with their description in literature. G.I.P.

(152f) *Multiceps multiceps* is reported for the first time from *Rupicapra rupicapra* from Yugoslavia. G.I.P.

(152g) Numerous hydatid cysts "exceeding the size of an orange" were found in the liver of a one-year-old pig. G.I.P.

153—Veterinarski Arhiv.

a. VRAŽIĆ, O., 1957.—" Parasiti poljske jarebice (*Perdix perdix* L.) N. R. Hrvatske." [Parasites of the common partridge (*Perdix perdix* L.) in P. R. Croatia.] **27** (1/2), 25–32. [English & German summaries pp. 31–32.]

(153a) On autopsy of 43 partridges (*Perdix perdix*) collected in seventeen districts of Croatia, 11·5% were found infected by *Heterakis gallinarum*, 9% by *Hymenolepis* sp. and 4·5% by *Capillaria longicollis*, *Syngamus trachea* and by *Raillietina* (*R.*) *globirostris*. The latter is reported for the first time for this country. G.I.P.

154—Veterinary Medicine.

a. ENZIE, F. D., COLGLAZIER, M. L. & WILKENS, E. H., 1957.—" Newer treatments for helminthic infections. Part I." **52** (6), 267–273.
b. SCOTT, G. C., 1957.—" Survey of parasitism in cattle." **52** (6), 277.
c. WHITNEY, L. F., 1957.—" Practical test of the efficacy of piperazine citrate in pigeons." **52** (6), 298–299.
d. HERLICH, H. & ROHRBACHER, Jr., G. H., 1957.—" Critical test of the efficacy of *n*-butyl chloride as an anthelmintic in cattle." **52** (7), 329–330.
e. ENZIE, F. D., COLGLAZIER, M. L. & WILKENS, E. H., 1957.—" Newer treatments for helminthic infections. Part II." **52** (7), 331–336, 356.
f. GAILIUNAS, P., 1957.—"Cysticercosis in cattle as a herd problem and its significance to the public health." **52** (8), 379–381.
g. ENZIE, F. D., COLGLAZIER, M. L. & WILKENS, E. H., 1957.—" Newer treatments for helminthic infections. Part III." **52** (8), 387–394.
h. STONE, R. M., 1957.—" Heartworms in the Midwest." **52** (9), 441.
i. TODD, A. C., 1957.—" Large animal parasitology in veterinary practice." **52** (9), 459–460.

(154a) In this revised version of a paper presented at a symposium in the University of Pennsylvania, Enzie *et al.* review details collected by the Agricultural Research Service of the U.S. Department of Agriculture on the efficacy and administration of some recent anthelmintics, viz., sodium fluoride, toluene and piperazine compounds in the treatment of horses and piperazine adipate and low-level phenothiazine administration in the treatment of cattle. A single calf infected experimentally with lungworms showed no reduction in the number of larvae when given low-level phenothiazine treatment, but fewer of them became infective as compared with the larvae from a control. M.MCK.

(154b) Faecal samples of cattle, mainly beef cattle, from Illinois, eastern Iowa and north-eastern Missouri were examined in winter. The flotation technique using potassium nitrate is fully described. The density of eggs in the 440 herd samples (each herd of approximately 25,000 cattle) were classified as heavy in 8·4%, moderate in 21·4%, light in 60% and negative in 10·2%. No identification of worm infections was made. M.MCK.

(154c) Whitney has correlated the lack of success of racing pigeons with high intestinal parasite infections. He removed *Ascaridia columbae* from his own racing pigeons with piperazine citrate offered in the drinking water for periods of 60 hours at the rate of 8 gm. per gallon. This was harmless even to two-day-old squabs and the birds' condition improved markedly. He has treated a further 1,300 homing pigeons with no reported ill effects but a little nausea. M.MCK.

(154d) Following reports of the failure of phenothiazine to control trichostrongylosis in calves, *n*-butyl chloride was tested on calves eight to 19 months old. It proved ineffective when given either immediately after phenothiazine or alone. R.T.L.

(154e) The critical tests on the efficacy of the newer anthelmintics in sheep, goats, pigs and poultry reported by various authors in recent articles are summarized. R.T.L.

(154f) Gailiunas tabulates his findings of cysticerciasis in cattle in a slaughterhouse, where there was municipal meat inspection, in the Grand Rapids area of western Michigan from 1953 to 1956. The majority of the cattle came from mid-western States via Chicago

stockyards and were free from infection. The infection occurred in the local western Michigan animals and 59% of the cases were from locally infected herds. It is pointed out that the output of infected meat from these herds may be large and continuous from year to year. R.T.L.

(154g) The results of treatment by various recently introduced anthelmintics for cats and dogs are succinctly summarized from 35 publications which appeared between 1948 and 1956. It proved difficult to assess the value of the newer taeniacides for small animals as uniform methods of testing and comparable criteria of their efficacy were not employed. R.T.L.

(154h) *Dirofilaria immitis* is seldom found in dogs in the Mid-West. A case is now reported from Michigan but the dog had been born in Savannah, Ga. and had visited the South on two occasions. More complete autopsies on cases of suspected leptospirosis, chronic cardiac and bronchitic diseases would probably reveal a greater incidence of heartworm in the Mid-West than hitherto recognized. R.T.L.

155—Veterinary Record.

a. TAYLOR, E. L., 1957.—" An account of the gain and loss of the infective larvae of parasitic nematodes in pastures." **69** (22), 557–563.
b. SILVERMAN, P. H. & CAMPBELL, J. A., 1957.—" The relationship of environment and the incidence of parasitic disease in sheep." **69** (23), 577–579.
c. GRIPPER, J. N., 1957.—" A new anthelmintic." [Correspondence.] **69** (25), 633.
d. ALLAN, D. & BAXTER, J. T., 1957.—" On the overwintering on pasture of *Dictyocaulus viviparus* larvae in Northern Ireland." **69** (30), 717–718.
e. MARTIN, W. B., THOMAS, B. A. C. & URQUHART, G. M., 1957.—" Chronic diarrhoea in housed cattle due to atypical parasitic gastritis." **69** (31), 736–739.
f. GIBSON, E. A. & BARNES, E. G., 1957.—" *Acuaria uncinata* infestation in domestic geese and ducks." **69** (32), 754–756.

(155a) With reference mainly to trichostrongyles, Taylor deals at length with the factors directly controlling the numbers of larvae on sheep pastures, viz., the addition of embryos to pastures from infected faeces; the rapid growth of herbage which dilutes the numbers of larvae and provides increasing shade for the development of more larvae; and the continuous loss of larvae through their being eaten and through natural death. He bases his discussion of these factors on statistics collected at Weybridge, England or published by others elsewhere. Lambs can add astronomical numbers of eggs to pastures while adult sheep add relatively few. Sheep can ingest 72,000 larvae per day and remain healthy and are therefore very effective in cleaning heavily infected pasture even when grazing alongside lambs. Taylor points out that we are only beginning to perceive the complexity of the natural factors which control parasite populations or to think of adapting animal husbandry to them. M.MCK.

(155b) The environmental factors operating in the epidemiology of gastro-intestinal helminthiasis in sheep are considered under the headings: (i) host-parasite relationship, (ii) transfer of eggs from host to pasture, (iii) the free-living stage of the parasite and (iv) the intake of infective larvae. R.T.L.

(155c) Commenting on a recent advertisement of a new drug for the removal of lungworms, Gripper suggests that details of field trials should have been published previously, or at the same time, so that members of the veterinary profession could answer inquiries as to its efficacy. R.T.L.

(155d) Allan & Baxter jointly report on independent observations made 25 miles apart, in the north of Ireland, on the overwintering during 1956–57 of *Dictyocaulus viviparus* larvae on pastures in the absence of fresh contamination. The winter months were relatively mild and damp. R.T.L.

(155e) Ten outbreaks of severe chronic diarrhoea and emaciation in young dairy cattle on farms in the west and south of Scotland were investigated during the spring and early summer of 1956. The only constant finding at autopsies from each outbreak was the presence

of large numbers of *Ostertagia ostertagi* and the only constant pathological change noted was a marked degree of granularity and thickening of the abomasal mucosa. In eight of the outbreaks the cattle had been housed for periods up to five months before the onset of clinical symptoms. As a proportion of the *Ostertagia* found at autopsy were immature the extended asymptomatic prepatent period during the housing of the animals may be explained by an inhibition of development associated with the presence of the considerable numbers of parasites in the mucosa. R.T.L.

(155f) Two outbreaks are reported of *Acuaria uncinata*; one in domestic geese, near Dereham, Norfolk, the other in white Aylesbury ducks near Bungay, Suffolk. The flock of ducks became unthrifty but no deaths occurred, whereas the mortality among the geese was 30%. R.T.L.

156—Wasmann Journal of Biology.

a. SARKISIAN, L. N., 1957.—"*Maritrema uca*, new species (Trematoda: Microphallidae), from the fiddler crab, *Uca crenulata* (Lockington)." **15** (1), 35–48.

(156a) A metacercaria encysted in the Fiddler crab *Uca crenulata*, in California, is a precocious form of *Maritrema uca* n.sp. That the first intermediate host is *Cerithidea californica* was proved experimentally by exposing uninfected crabs to xiphidiocercariae shed by mud-flat snails. All attempts to raise the adult stages by feeding metacercarial cysts to chicks and mice failed. R.T.L.

157—Wiadomości Parazytologiczne. Warsaw.

a. GERWEL, C., KASPRZAK, W. & PAWŁOWSKI, Z., 1957.—"Obraz inwazji przewodu pokarmowego ludności wiejskiej województwa poznańskiego, cz. II." [Survey of the alimentary infections in the rural population in the Poznań area.] **3** (1), 3–10. [English & Russian summaries pp. 9–10.]

b. GERWEL, C., KARLEWICZOWA, R., KASPRZAK, W. & RYDZEWSKI, A., 1957.—"Przyczynek do znajomości parazytofauny przewodu pokarmowego ludności wiejskiej Pojezierza Mazurskiego." [Contribution to knowledge of the parasitic fauna of the alimentary tract of the rural population in the Lake District of Mazuria.] **3** (1), 11–17. [English & Russian summaries p. 13.]

(157a) The parasites found during 1954–56 in 2,169 farm workers and their families in the Poznań area included *Trichuris trichiura* in 51·2%, *Ascaris lumbricoides* in 8·8% and *Fasciola hepatica* and *Hymenolepis nana* in one person each. Children seven to nine years old had the highest infections. The percentage occurrence of mixed infections is tabulated. *H. diminuta* and *Taenia saginata* were absent but had been found the previous year. G.I.P.

(157b) Coprological examination of 679 farm workers and their families from the lake area in Mazuria, Poland, revealed *Trichuris trichiura* in 17·2%, *Ascaris lumbricoides* in 10·1%, *Taenia saginata* in 0·9% and *Hymenolepis nana* in 0·1%. *Diphyllobothrium* and *Opisthorchis* infections were absent although the population consumes large amounts of fish throughout the year. The infections in various age groups and the frequency of mixed infections are tabulated. G.I.P.

158—Wiener Tierärztliche Monatsschrift.

a. SUPPERER, R., 1957.—"Über die Ursachen der schweren Leberegel-Erkrankungen im Jahre 1956." **44** (2), 107–109.

(158a) Following an increase in fascioliasis in Austria in late 1954 and in 1955, the disease became endemic in Styria, Karinthia, Salzburg, Upper Austria and Burgenland in 1956 and will reach a new peak in the spring of 1957, if food is poor, because the feeding of green-stuffs has to be postponed. All animals which have been at pasture the previous year should be treated just before going out to grass and again after 10–12 weeks at pasture. Ditches must be cleaned and water-logged pastures treated; the best results are obtained if this is done in the first half of April. M.McK.

159—World Health Organization. Technical Report Series.

a. ANON., 1957.—" Study Group on the ecology of intermediate snail hosts of bilharziasis. Report." No. 120, 38 pp.

(159a) This report deals concisely with the distribution of the intermediate hosts of schistosomes in relation to hydrogeology, the physical, chemical and biological factors conditioning their habitats and the seasonal and climatic factors influencing their life-cycle, the application of our present knowledge of oecology to bilharziasis control measures (including molluscicides, sanitation measures, irrigation engineering control measures, water management of streams and dams) and the modification of fishing and farming practices. Quantitative methods are suggested for the measurement of molluscan population densities and for the evaluation of control methods and suggestions are made for further studies in molluscan o ecology and physiology in relation to control measures. R.T.L.

160—Zeitschrift für Pflanzenkrankheiten (Pflanzenpathologie) und Pflanzenschutz.

a. SCHERNEY, F., 1957.—" Morphologische und histologische Untersuchungen an *Heterodera*-Arten." **64** (3), 131–139. [English summary p. 138.]

(160a) Cysts of *Heterodera rostochiensis*, *H. schachtii* and *H. avenae* [*H. major*] can be distinguished by their shape and colour, and by the shape and size of the eggs contained in the cysts. The tubercles on the cyst wall of *H. rostochiensis*, *H. schachtii* and *H. avenae* are related in number per square dimension as 4:6:7. Histological differences between the species in the structure of the cyst wall are described. J.J.H.

161—Zoologicheski Zhurnal.

a. OLIGER, I. M., 1957.—[Fauna of the parasites of the family Tetraonidae in the forest zone of the European part of the RSFSR.] **36** (4), 493–503. [In Russian: English summary p. 503.]
b. ZINOVEV, V. G., 1957.—[Enzymatic activity of the nematodes parasitizing plants.] **36** (4), 617–620. [In Russian: English summary p. 620.]
c. MYUGE, S. G., 1957.—[On the physiological specificity of the bulb nematode, *Ditylenchus allii* Beij.] **36** (4), 620–622. [In Russian: English summary p. 622.]
d. PARAMONOV, A. A., 1957.—[On the principles of taxonomic differentiation in nematology. 1. Analysis of the subfamily Pseudodiplogasteroidinae Körner, 1954.] **36** (5), 641–653. [In Russian: English summary p. 653.]
e. KOMAROVA, M. S., 1957.—[Seasonal parasitofauna dynamics of the tench in the Donets River.] **36** (5), 654–657. [In Russian: English summary p. 657.]
f. LUKIN, E. I., 1957.—[On the distribution of medicinal leech in the U.S.S.R.] **36** (5), 658–669. [In Russian: English summary p. 669.]
g. ZHUKOV, E. V., 1957.—[New genera and species of trematodes—parasites of fish in the Far Eastern seas.] **36** (6), 840–846. [In Russian: English summary p. 846.]

(161a) The parasitic fauna of four species of grouse from Kostroma, Mordov and Rybinsk Reservoir districts of the U.S.S.R. included five trematode, nine cestode and three nematode species. *Ascaridia compar* was the most frequent helminth. Trematodes were found mainly in young birds as these feed predominantly on molluscs, while the diet of older birds consists essentially of plants. *Raillietina urogalli*, *R. cesticillus* and *Davainea tetraoensis* (parasitic in young birds) were found in high intensities in nearly all the birds over the whole area. The heaviest infections occurred during June-July and birds 10 to 15 days old were already infected with most of their parasites. The much higher infection of young birds evened out by October; in winter trematodes were absent while cestode and nematode infections were low. G.I.P.

(161b) The amount of amylase, invertase and proteolytic enzyme excreted into the surrounding water by *Heterodera marioni*, *Ditylenchus destructor* and *D. allii* varied with the species and could be correlated with the variety and chemical composition of the host plant. *H. marioni*, with a large circle of hosts, showed the highest enzymatic activity and 0·025 ml. of the worms at 2°-25°C. released sufficient amylase in three hours to hydrolyse 0·5 mg. of

starch. A rise in temperature from 4–6°C. to 24°C. increased amylase excretion in *H. marioni* several times more than in *D. destructor*, but did not affect that of *D. allii*. G.I.P.

(161c) *Ditylenchus allii* is physiologically distinct from *D. destructor*. An amount of amylase sufficient to hydrolyse 0·4 γ [γ = 0·001 milligrammes] of starch, and 0·001 [no units given] of proteolytic enzyme were produced by one worm in one hour. Protopectinase excreted into the host plant brings about the break-down of the intercellular protopectin resulting in the maceration of tissues without damage of the cells, which in the onion have been shown to possess nematicide properties. The products of protopectin break-down are pectin acids and the *p*H of infected onions is 4·5 as compared with 6·2 in healthy ones. G.I.P.

(161d) The three criteria established by Paramonov for the determination of the taxonomic validity of characters are (a) the frequency of their occurrence within a group, (b) the type of combination of characters, and (c) the kind and direction of phylogenetic changes of characters. Using these he analyses Röhm's (1956) work on Pseudodiplogasteroidinae, revises the subfamily and discusses its phylogenetic relationships. Consequently Pseudodiplogasteroidinae remains as originally erected by Körner in 1954, while *Pseudodiplogasteroides* (*Protodiplogasteroides*) *saperdae* becomes *Protodiplogasteroides saperdae* n.comb. and is transferred to Diplogasteroididae. G.I.P.

(161e) The parasites found in a two-year examination of 120 tench from the river Donets included twelve helminth species and one leech *Piscicola geometra*. The percentage occurrence of the parasites in the various fish organs is tabulated. Infections were highest in summer; their seasonal variation is given for *Dactylogyrus macracanthus*, *Asymphylodora tincae* and *Contracaecum squalii*. G.I.P.

(161f) *Hirudo medicinalis* is common in the southern part of European U.S.S.R. and is particularly frequent in the Caucasus, Moldavia and southern Ukraine. It is also found in the extreme west of Russia and some localities of Central Asia, but not in eastern Siberia, the Far East of Russia or most of western Siberia. In the author's opinion the range of occurrence of *H. medicinalis* is delimited by its Mediterranean origin and oecological requirements rather than by intensive collecting by man. G.I.P.

(161g) Two new genera and five new species of digenetic trematodes are described and figured from fish in the Seas of Japan and Okhotsk. *Anomalotrema putjatini* n.g., n.sp. found in *Pleurogrammus azonus* and *Hemilepidotus gilberti*, is placed in Opecoelidae and is characterized by the piriform ventral sucker which has a cordon-like structure with free ends on its narrower anterior end. *Pseudozoogonoides* n.g. made for *P. microacetabulum* (Shulman-Albova, 1952) differs from *Zoogonoides* in having paired vitelline glands and also from it and *Diphterostomum* in the ventral sucker being equal to, or smaller than, the oral one. In *Lepidophyllum armatum* n.sp. from *Bryostemma* sp. the body is covered with powerful cuticular spines and the cirrus sac reaches the lower margin of the ventral sucker which is larger than the oral one. In *L. brachycladium* n.sp. from *H. gilberti* and *Gymnocanthus herzensteini* only the anterior body carries cuticular spines, the ventral sucker is the smaller one and lies at the end of the gut caeca which do not extend to the vitellaria and testes, the piriform cirrus sac does not reach the ventral sucker. The eggs measure 0·050 × 0·029 mm. and have a polar process. In *L. pleuronectini* n.sp. from *Cleisthenes herzensteini*, *Hippoglossoides elassodon dubius*, *Pseudopleuronectes herzensteini* and *P. yokohamae*, the cirrus sac does not reach the lower margin of the ventral sucker. The cuticular armature covers the whole body but is weaker than in *L. armatum*. These characters distinguish the three *Lepidophyllum* species from one another and from *L. steenstrupi*. *Urinatrema hirudinacea* n.sp., from *Hexagrammos octogrammus* and *H. lagocephalus*, differs from *U. hispidum* in the branching intestine, the ramified testes and the lateral vitellaria which stretch anteriorly to the genital pore. G.I.P.